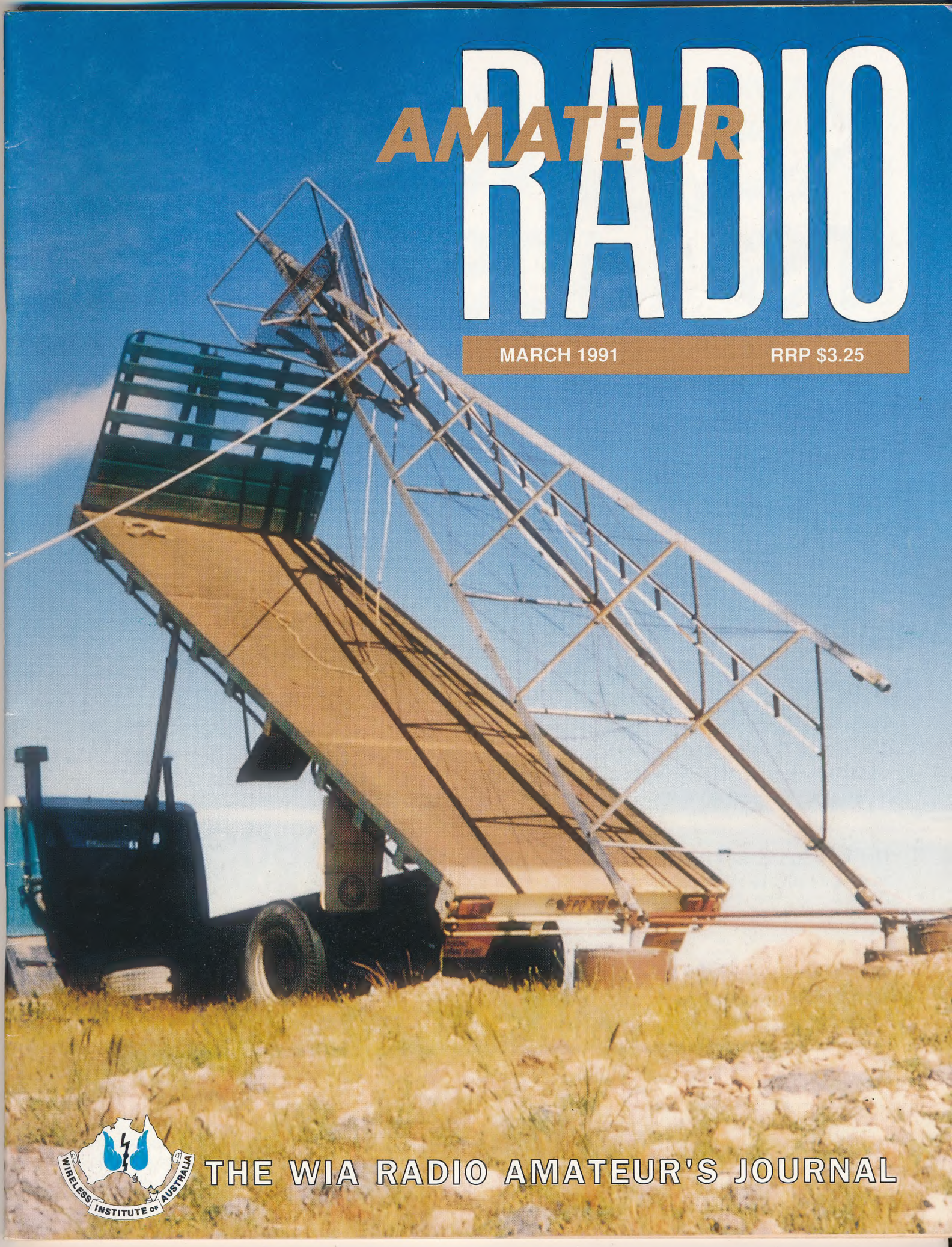

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THE WIA RADIO AMATEUR'S JOURNAL

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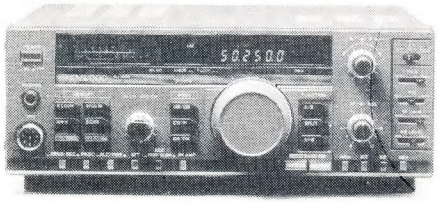

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THE WIA RADIO AMATEUR'S JOURNAL

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Cover

One way of overcoming the initial difficulty of erecting a tower! The picture shows the VK2RGN 2m and 70cm repeater tower in course of erection. This repeater, located atop Mt Grey, is the pride and joy of the Goulburn Amateur Radio Society. Photo – David Thompson VK2BDT.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Denouncing the Doomsayers

It isn't often that this editorial quotes in quantity from another, but it certainly reduces the need for original thought! When the other editorial has such a worthwhile message, it does make the borrowing easier. I'm talking about the January issue of *World-radio* (an American commercial magazine) but actually its editor, Armond Noble N6WR, himself borrowed it from the newsletter of the Sun City (Texas) Amateur Radio Club. Our situation in Australia is virtually an exact parallel, detail for detail. The writer in the original newsletter was Mark Forbes KC9C, and the title was "Enough Doomsday Garbage".

"I've read enough garbage about the coming end of amateur radio, and enough 'information' supporting such conclusions which have no semblance of fact. Here are the facts — you can look them up:

1) *Amateur radio is GROWING . . . the number of hams has roughly doubled in the past 20 years (source: FCC data and the Callbook). In fact, the rate of growth is about* ***twice*** *that of the general population (source: ibid, and facts on file).*
2) *We've acquired several new bands in the past 10 years, particularly 12, 17 and 30 metres.*
3) *We've acquired more new privileges in the past 10 years than in any decade of the service, specifically space and packet related, plus HF for technicians and VHF/UHF for novices.* (There is one difference in Australia — our limiteds have no HF, but US technicians do have a Morse qualification. 3ABP).
4) *We've acquired more new emissions in the past 10 years than in any decade of the service, especially ASCII, packet and AMTOR.*
5) *It is quicker and easier to get tested and licensed than ever before.* (I omit the US details, but our exam devolvement has produced very similar results. 3ABP).
6) *No longer do you have to wait 4-12 weeks after passing an exam . . . to begin using your new, hard-earned privileges. For the first time instant upgrading is possible.*

Yes, yes, we have lost some frequencies. It's lamentable, but it sure isn't new. It's been going on since 1977, and rearrangement of the spectrum will continue as long as there's human life on earth. We have more frequencies than any time in recent history.

Let's fight to keep what we have. And, yes, let's work to get more. But all this moaning and crying and tossing about insupportable conclusions based on fabricated data does no one any good.

If you are that upset with your hobby then please find something else to occupy your spare time."

May I ask you two questions? Would we have reached this relatively happy state, and have hopes of improving on it, had it not been for the efforts of the ARRL and the WIA and all the other societies in the IARU? Should not ALL amateurs support their societies?

Amateur Radio
Helping our Community

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

1990 Ron Wilkinson Award Winner

At the February quarterly meeting of the full WIA Executive, it was decided that the Ron Wilkinson Award for 1990 will be presented to Keith Cunliffe VK2ZZO, for his continuing effort and achievement in amateur television and his part in the ATV test transmissions via AUSSAT. In addition to a very handsome certificate, Keith will receive $200.00 plus one year's membership of the WIA.

It was also decided by Executive that a President's Commendation Certificate be awarded to the Gladesville Amateur Radio Club for their activities in association with Keith Cunliffe in presenting ATV transmissions via AUSSAT and their work in the field of educational ATV.

World First for VK3 Amateur

Maggie Iaquinto, VK3CFI, has become the first in the world to work the Russian satellite station, U2MIR on packet radio. After two years of trying to make an MIR contact she finally spoke to Musa on 13th January 1991 at 2145 UTC.

Maggie spoke with Musa and Victor U9MIR on each of several mornings and then, during the contact on Saturday, 19th January, Musa asked her to come up on packet. After a hurried setting up, connects were made but by then the pass was over.

Having received Maggie's instructions, Musa had his PMS operating by the next pass 92 minutes later. On subsequent passes files were exchanged and Musa is now fully operational on packet. He is also anxious to experiment with BBSs.

Maggie has sent up files on this and VK3JAV has set up a port for Musa to access his BBS. Maggie is justifiably very excited about her activities.

Interference Investigations

DoTC advises that Ministerial approval has been received for institution of the call out fee of $60.00 for interference investigations by Departmental inspectors.

The Executive Office recently received a copy of the second edition of *"Better Television and Radio Reception, Your self-help guide"*. This booklet was first published by DoTC in 1989, and has proved extremely useful to both service technicians and individuals with interference problems. The new edition does not appear to include many changes apart from some of the pictures and some colour, but it does up-date the contact addresses for DoTC offices and Inspectors, and enlarges the

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun (R Denotes repeater) Times 1045 and 1915 on Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Tim Mills David Horsfall Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2ZTM VK2KFU	1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0900-1600 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	Murray Kelly Eddie Fisher Eric Fittock	VK4AOK VK4ABX VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Alyn Maschette John Farnan Bruce Hedland - Thomas	VK6KWN VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

list of filters and similar devices.

A Media Statement from the DoTC notes that, of 15,000 interference complaints last year, *"only 3,000 were relevant to the Department's responsibilities in fixing interference to radio, television and radiocommunications services"*. Most of the complaints received were due to faults in the complainants' equipment or to interference from powerlines. A Telephone Advisory Service has also been established (phone 008 077 145) which, with the help of the booklet, should reduce the demand on DoTC services and allow staff to concentrate on other matters.

SEANET Convention

The 1991 annual SEANET convention will be held in Chiang Mai in Northern Thailand on the weekend of 8th - 11th November. The Radio Society of Thailand will be host to the convention, and will arrange other activities such as sight-seeing or shopping trips.

SEANET operates daily on a frequency of 14.320 MHz from 1200 Z with, on average, over 50 stations in the south Asian area checking in each day. The convention is a chance for all these operators to meet in person. Naturally other interested amateurs are welcome. A report on the 1989 SEANET convention was published in the September 1990 issue of Amateur Radio magazine, and a report on the 1990 convention is in this issue.

Further details of this interesting weekend can be obtained from GPO Box 2008, Bangkok 10501, Thailand, or via the net.

Visitors Licence in Thailand

The January 1991 bulletin from the Radio Amateur Society of Thailand notes that foreigners who hold valid home amateur radio licences and who are resident in Thailand may now apply for a temporary licence there. Conditions under which these licences may be obtained are listed in the bulletin. This system applies to citizens of countries which do not have reciprocal licence arrangements with Thailand. A reciprocal agreement between Thailand and the USA has just been concluded.

Standards Australia Symposium

During November 1990 Standards Australia (SA) conducted a seminar on "EMI/EMC - where is Australia going?" The same seminar was presented in Sydney, Melbourne and Canberra to achieve a wide exposure and papers were presented by speakers from government, QANGOs and industry. A number of WIA members attended at the various venues, often in connection with their employment.

Several papers were of interest to the radio amateur and permission has been obtained to reprint at least two in Amateur Radio magazine. Of particular interest was the relationship between Standards Australia and AUSTEL.

Standards Australia, through its many committees, prepares a wide range of Australian Standards; some even being total reprints of overseas standards between SA covers and with a SA number. Standards Australia, being an advisory body, cannot mandate any of its standards; they must be prescribed by a government body, agency, authority or an industry controlling body.

For example, the Australian Standard on electrical wiring practices is called up by all state electricity authorities as their minimum requirement. On the other hand standards issued by AUSTEL are mandatory requirements on builders, installers and others engaged in the communications industry. Standards Australia and AUSTEL work together in producing AUSTEL standards so the high degree of consultation and industry involvement seen in SA standards will carry over into AUSTEL standards.

It was not clear from the seminar why AUSTEL chose this route rather than cooperating in producing Australian Standards and then mandating them. Perhaps some obscure legal nuances are involved?

Another paper of interest related to an international electromagnetic compatibility (EMC) Standard for information technology equipment (ITE), which is presently covered in IEC/CISPR 22, published by SA as AS 3548. Agreements shortly to be implemented in the European Economic Community will have world wide implications for international manufacture and marketing.

The WIA is a member of Standards Australia and continues to monitor its activities on your behalf for matters which might impinge upon amateur radio operations.

WARC 92 APG Committee T

The Australian Preparatory Group for WARC 92, Technical Committee T, held its sixth meeting in Canberra on 18th December 1990. The WIA was represented by David Wardlaw VK3ADW, its WARC92 team leader and Ron Henderson VK1RH.

The meeting devoted most of its time to reviewing the implications for Australia of the reports of a series of Interim Working Parties which had met in several countries during recent weeks.

Several key issues arose including consideration of which services can share band segments, frequencies for vertical radiation, weather sounding radars, the needs of Low Earth Orbit (LEO) satellites and the ever present demands for spectrum in the 1 to 3 GHz band.

Amateurs will be no strangers to frequency sharing, for we are the secondary service in a number of our bands. However, are you aware of the degree of sharing that takes place on a daily basis? Just watching a band segment for a short period of time with a pan-adaptor receiver or a spectrum analyser is an education, as ionospheric sounders, scanners and other incidental short term radiations take place on a daily basis.

Sharing can be on a geographic basis, common at UHF and microwaves (we share 576 MHz now with television broadcasters), or on a frequency basis (such as on 7100 - 7300 kHz), or on a time basis (as amateurs did with MF broadcasting stations in the 1930's).

Committee T is preparing matrix tables of services to indicate which service can share with which and under what conditions. These tables will be part of the Australian delegation brief to WARC 92 so the WIA representatives, acting for the Australian amateur service, are active in this table compilation to ensure they accurately represent the real world of radio transmissions.

Committee T has now reached the stage where small sub-committees of selected specialist members are preparing summary or conclusions papers, distilled from over one hundred Committee T input papers. The meeting in late January 1991 will review those summary papers and their implications upon the WARC92 agenda.

Shortly, a number of Committee T members (including David Wardlaw from the WIA) will travel as the Australian delegation to a CCIR Joint Interim Working Party (JIWP) meeting, to be held in Geneva in early March 1991. The JIWP is charged with producing the technical reference material for the WARC, so once again the WIA will be present in this lead up to decision making.

Use 'em or Lose 'em

This reference to the amateur bands has been around

for a long time, but it is probably more appropriate now than ever before. Commercial interests are looking at under-used band space with greedy eyes and offers to pay for that to which we, so far, have had almost free access.

Our delegates to WARC 92, and the preliminary meetings, will be arguing our need for spectrum on the basis of the value of the amateur service to the community and our contributions to technological developments. But it is hard to argue that we should retain allocations that are unused for most of the time.

For instance, have you used 10 metres lately?

Intruders

Commercial interests are not only looking at our bands. Some are actively using them. More volunteers are always needed to log these intrusions.

The WIA Intruder Watch Co-ordinator, Gordon Loveday VK4KAL, will be happy to supply information on how to begin logging and reporting the commercial and broadcast stations trying to take over our bands. Drop Gordon a line at "Aviemore", Rubyvale, QLD 4072, and tell him how you can help.

Improved Commercial Broadcast Facilities

DoTC recently advised of several increases in radio and television services to country areas.

Test transmissions of both radio and television from the ABC for the Mallacoota area were due to begin in early January, via AUSSAT and a transmission facility on Mirrabooka Hill. Television will be on UHF Channels 56 and 57, radio on 103.3 and 104.9 MHz.

Plans submitted by commercial television licensees for broadcasts in the northern NSW area have been approved. Networks 9, 7 and 10 affiliates expect to begin operations in this area during 1991 and 1992.

Two new commercial UHF television services to cover much of regional Queensland were due to begin at the start of this year.

Spectrum Plan Published

Australia's new radio frequency spectrum plan has now been published and copies are available from Australian Government Publishing Service bookshops for $21.50.

This plan is now *"the legal basis for allocating spectrum to all types of services in Australia, including broadcasting, mobile radio, aviation, defence, radio-astronomy and many other services"* according to the DoTC Media statement.

Morse Code Practice

Although some of our members feel that proficiency in Morse code is no longer essential in the amateur service, it is likely to remain a prerequisite for a licence at least until the WARC after WARC92.

Several WIA Divisions help students to become proficient in this field through weekly Slow Morse broadcasts. The program for these transmissions is printed near the back of Amateur Radio magazine in alternate months, so if you know a learner who needs help you can direct them where to listen.

Recent advice from the VK4 Slow Morse Co-ordinator includes a few changes to the schedule, which will be incorporated into the listings for its next publication.

As well as the official WIA Slow Morse transmissions, a number of other slow morse nets are run by groups or individuals. One of these is the *"Early Birds"* net which operates on 3.539 MHz at 07.00 EST each day.

Whatever your needs, there is probably a slow morse training transmission that will suit you.

American Code-Free Licences

As reported previously the USA has introduced a code-free grade of licence at technician level, similar to the Australian Limited licence, which has been available for over 35 years.

The introduction date was set at 14th February 1991. The ARRL expects a significant influx of new licensees as a result of this new grade of licence.

CW Testing of the Disabled

The American control body, the Federal Communications Commission (FCC) has established procedures whereby people with certain disabilities may be exempted from the 13 and 20 wpm Telegraphy tests. Exemption will be based on a medical certification that the person is too severely handicapped to be able to pass the examination.

There is no intention to allow exemption from the 5 wpm entry level Novice licence for operation on the bands below 30 MHz. Recent *"Over to You"* letters published in Amateur Radio magazine have debated the advisability of the WIA attempting to persuade DoTC to consider a similar proposal.

WICEN

Already this summer several WICEN groups have ben activated to help in civil emergencies. The arrangements for activation, and the authorities for which help is provided, vary from state to state, but in all areas the potential value of WICEN is being more and more appreciated by the civil emergency authorities.

Only the army has a greater range of frequencies than the amateur service, and no other body has such access to sophisticated equipment, variety of modes or numbers of trained personnel. Provision of communications for community events by WICEN is an ideal way to bring the benefits and potential of the amateur service to the attention of the general public. The image that the amateur operator presents at such a function is very important in establishing the hobby in the minds of the audience.

USA to Protect Amateur Frequencies

A Bill recently introduced to the USA Congress will, when passed, ensure that *"the Federal Communications Commission shall not diminish existing allocations of spectrum to the Amateur Radio Service after January 1, 1991. The Federal Communications Commission shall provide equivalent replacement spectrum to the Amateur Radio Service for any frequency reallocation after January 1, 1991."*

USA Novice Band Changes

The USA Federal Communications Commission (the American equivalent of the Australian DoTC) has announced a change in its rules to move the 80 Metre Novice band down from 3700-3750 kHz to 3675-3725 kHz. The move is intended to reduce mutual interference between American and Canadian amateur stations.

Phone Patch

It is a requirement by Telecom that before a phone patch can be used, the equipment must include an approved Line Isolation Unit.

Licensed Australian radio amateurs have been given permission to build their own line isolation units in accordance with an article which appeared in the September 1987 issue of Amateur Radio magazine, but these units must be inspected and approved by an authorised inspector before being put into use.

Until recently this inspection has been carried out by Geoff Donnelly, VK2EGD. Geoff has been of invaluable assistance to many amateurs but, for personal reasons, has

had to relinquish this position.

The New South Wales Division has now appointed Brett Wikinson VK2XMU to act in his place.

Licensing Statistics

The quarterly return from DoTC giving statistics of licensed Australian Radiocommunications stations shows that in the three months from September 1990 the amateur service has grown from 18948 to 19194, an increase of only 156.

In the same period the licensed Citizens Band Radio Service has grown by 11,848, and now stands at 407,844. This works out at a growth rate of 2.9% per quarter as against 0.8% for the amateur service.

When there is that much interest in radio as a communication method, why is the amateur service attracting so few newcomers?

Order of Australia for Radio Amateur

It is with great pleasure I advise to those of you who do not already know that Graham Ratcliff VK5AGR, the WIA Federal AMSAT Co-ordinator, was listed as a member of the Order of Australia in the 1991 Australia Day Honours list.

The citation said "For services to amateur radio organisations".

Congratulations, Graham. Well done!

WIA Membership Grades

There seems to be some confusion among members about the various grades of membership of the WIA. When some degree of standardisation between the Divisions was achieved in 1989, it was agreed that the concessional or "G" grade rate should be instituted to offer a concession to any members on reduced incomes on a short or long term basis.

The criteria for this concession were set at possession of a Pensioner Health Benefits card, or certification of full-time student status. Provision was also made for the concession to be allowed at the discretion of the Division to members whose financial circumstances are not better than those of a holder of a Health Benefits Card.

It was never intended that the concession would be automatic to all retired members, or all members over a certain age. If we worked on this system, a substantial number of our members would be at the concessional rate (the average age of radio amateurs in Australia is now estimated to be 54 years!).

Back Copies of Amateur Radio

For economic reasons a normal monthly print run for Amateur Radio magazine is generally 150 copies more than the number that is sent out to members and direct subscribers. By the time copies have gone to article contributors, advertisers, families of Silent Keys, in exchange for international magazines, and are included in the many *"WIA Information Packages"* forwarded to prospective members each month, this number is reduced.

In some months there are very few copies of the magazine left for members who happen to want an extra copy to give away (an additional copy of Amateur Radio magazine can usually be purchased from the Executive Office at a cost of $4.50 posted per issue). For instance, during 1990 the office ran out of stocks of both the June and the November issues.

It is of course quite uneconomic to have more printed (considerable numbers of excess copies printed in earlier years recently had to be dumped) but, if there is a particular article you require, photocopies can be arranged at a cost of $2.50 per article.

Hamads

For many of our members the first part of Amateur Radio magazine they turn to when it arrives in the post each month is the Hamads page. Usage of this page by members has increased now that the lead time is reduced to just over two weeks from closing date to arrival of the magazine in the mailbox.

But it is not necessary to wait until the closing date to submit your advertisement. It can be received and processed at any time, and will be published in the first possible issue after receipt at the Executive Office.

Hamads is a very economic way to reach a large potential market. Incidentally, those who are not members, or who have commercial quantities of goods to advertise, are always welcome to use the Trade Hamads section.

Executive Office Book Stocks

The Executive Office is still holding stocks of WIA logbooks, both horizontal and vertical format at $5.00 each to members (plus postage), Band Plan booklets at $2.80 each including postage, and Study Guides for Novice Operators Certificates of Proficiency at $2.50 each posted.

There are also a few 1991 Call Books available at $9.50 plus postage.

WARC Donations

Thanks are due for donations received this month from J. P. Hodkinson VK2BHO, and D. R. Rogers VK5KON.

All financial contributions to assist WIA representation at WARC 92 will be gratefully received.

Twenty Year Index

The twenty year index is now a twenty two year index! As each issue of Amateur Radio magazine arrives the titles of the technical articles in it are added into the index. The index is available to members on disk ($10.00) or in hard copy ($5.00). This index has proved popular with members as well as being of great value in the Office. Being on a computer database, it allows sorting and printing of lists of articles by category or by author, etc.. This speeds up research considerably.

National WIA Meetings

A quarterly weekend meeting of the full Executive of the WIA was held in Melbourne over the weekend of the 9th and 10th February. In an intensive work period of over 18 hours, plus several more hours of informal discussion, a vast number of items were considered. Some of these were items which have been under discussion for some time, others were newly raised or were procedural matters which did not require lengthy consideration. More detailed reports of many of these items will appear in the April issue of Amateur Radio magazine.

General meetings always open with a period for reports by executive members and the General Manager. At this meeting George Brzostowski reported on plans in the VK1 Division to celebrate the 200th anniversary of Samuel Morse's birthday. The event will be conducted over a period of about 10 days with the main events on the 27th and 28th April. Special callsigns are being sought for a station at Canberra and one at the old Telegraphy Station at Alice Springs.

Bill Wardrop reported on a recent display of amateur radio in three large Adelaide shopping centres. Ron Henderson reported on plans for a WARC presentation at the 1991 Gosford Convention.

David Wardlaw reported on progress of the WARC preparation. After a Committee T meeting in Canberra in mid-February, David will then be attending a Joint Interim

Continued on page 7

Random Radiators

RON COOK VK3AFW &
RON FISHER VK3OM

THIS MONTH WE TAKE a quick look at a Z match as constructed and used by one of our Z match club users. We discuss the relative merits of quads and yagis as HF antennas. Some thoughts are shared on a most useful coax switch and a new book that I am sure will be of interest to readers of this column.

Firstly, I received a very nice letter from Geoff VK3BGC who has just found out the joys of using a Z match. Over to Geoff:

> This is a note from an appreciative builder and user of this Z-match tuner for the past few months. The photograph shows the item in use for the first time in the writer's portable station at a caravan park at Yamba NSW during October 1990. The antenna was a 20m dipole fed with 300-ohm ribbon and matching stub for a calculated 300-ohm resistive load at resonance. This dipole was also used on 10m (gingerly) radiating 100 watts with arcing in C2. Among the 10m DX contacts made was one with an amateur operating MM from the *USS Nassau* in the Gulf of Oman. For JOTA I made a 20m double-extended Zepp and obtained a VSWR of 1:1 on all bands.
>
> Operating behaviour is very much as described by yourselves and Lloyd Butler in *AR* for December 1990. With the 20m dipole as above at a fair height (10 metres) C1 was slightly greater than 300pF at 300 ohms fitting the curve of figure 4. I have acquired the skill of two-handed operation of C1 and C2 achieving 1:1 in seconds.
>
> The SWR indicator is the "Varimatcher" from the ARRL Handbook, 1968 edition, page 557.
>
> C1 is connected via a flying 50-ohm lead to preserve symmetrical geometry and allow it to be used as a separate instrument. This 9-inch-long device fits neatly inside the rear of the case.

Thanks Geoff, I hope this might give heart to our readers out there to give the Z match a try. You won't be sorry.

The VK3BGC equipment portable at Yamba NSW showing home-brewed Z Match atop an IC 735.

(continued overleaf)

WIA News continued from page 6

Working Party (JIWP) meeting in early March in Geneva as an accredited Australian delegate. Amateur frequencies under threat include some of the 7.1 to 7.3 MHz section of the HF bands, 70 cm and 2.3 GHz.

Some time was spent planning for the Annual General Meeting which now replaces the previous Annual Conventions. After investigation of costs and facilities provided by a number of possible venues, it was decided to return to the Brighton Savoy Hotel/Motel. Delegates will arrive on the evening of 19th April to enable an early start on the Saturday. It is hoped that business will conclude by mid-afternoon on the Sunday.

The Executive noted its appreciation of the offer of George Brzostowski to continue in the position of the WIA Legal Counsel, and took much pleasure in appointing George officially as the WIA Honorary Legal Counsel.

After several months of consultation, the specifications for the role of the Education Co-ordinator were finalised and accepted.

Extensive discussion ensued on future representations at international events such as WARC and IARU conferences. The need for another Melbourne-based member of Executive was also raised again.

If you require elaboration of any of the items discussed at this quarterly meeting of the full WIA Executive, please contact your Divisional Councillor. **ar**

Random Radiators *continued from page 7*

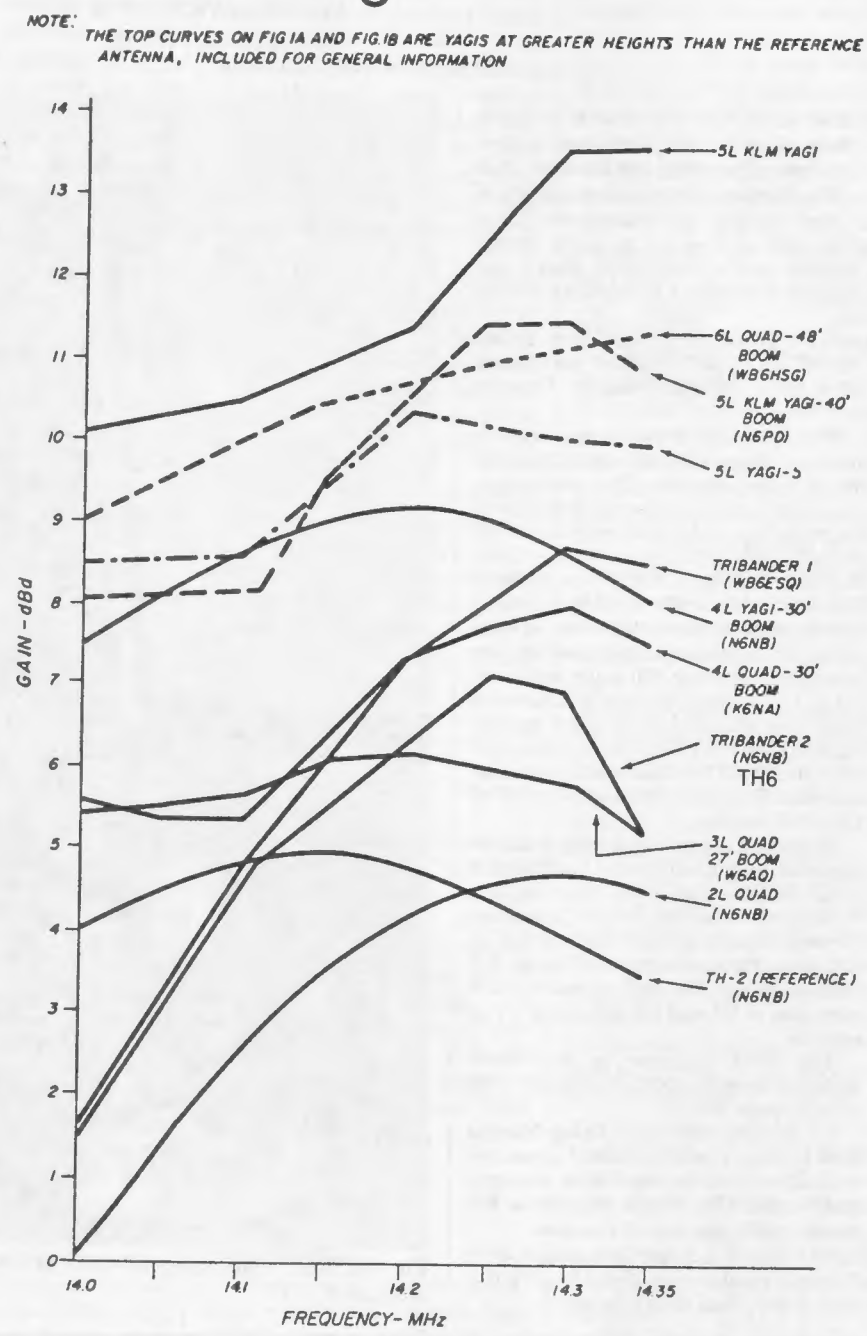
Quads vs Yagis

If you really want to get a heated discussion going on the air, just tell your contact that your Yagi will out-perform his Quad any day of the week. Everyone knows that a Quad should out-perform a Yagi because it has twice the length of element in it, hence a two-element Quad should out-perform a two-element Yagi by something under 2dB. And, of course, everyone knows that at a relatively low height, a Quad will out-perform a Yagi at that same height by something more than 2dB.

Right? Well, maybe and maybe not. Firstly, it seems to me that the greatest supporters of Quads are amateurs who have had Quads once upon a time. These people get a glazed look in their eyes when they tell you how their Quad opened and closed the band. Unfortunately, the Quad fell down a few years ago and they have since replaced it with a tri-bander Yagi. Well, so you ask, how much better (in dB) was the Quad compared to the tri-bander. It's at about this point that the answers get rather vague.

So where do we go to get some answers to our questions. I feel that an article published in the May 1979 issue of *Ham Radio* provided many of the answers. The author, Wayne Overbeck N6NB, set out on one of the most ambitious experiments with antennas that I have ever come across. He took a trailer-mounted 75ft tower with tri-band two-element Yagi on top to many locations around California, and did side-by-side test against many antennas, both Quads and Yagis. With a reference against these antennas he was able to directly compare the performance of big and small beams and come to some interesting conclusions. However, Wayne did not only have one portable 75ft tower, he had two, and was therefore able to do tests on relative performance at various heights. But, let's go back to the start and let Wayne set the scene:

> The Quad-versus-Yagi question has been argued with anecdotes, testimonials and hunches, as well as with theory and quantification. Intuitively, some Quad builders have concluded that their antennas were just not 2dB better than similar sized Yagis. Others have reached the opposite conclusion by trusting the same intuitive sixth sense. The great majority of big winners in DX contests today are using Yagis, not Quads. If a Quad is equal to a Yagi nearly twice its size, how could this be?
>
> In an attempt to resolve this issue, I've spent hundreds of hours measuring the performance of Quads and Yagis in both the high frequency and VHF spectrum and have encountered considerable evidence that the cubical Quad is NOT inherently superior to the Yagi.
>
> This seems to be particularly true below 100MHz. However, there are potential variables that may sometimes bias the results of UHF modelling in favour of the cubical Quad.


NOTE: THE TOP CURVES ON FIG.1A AND FIG.1B ARE YAGIS AT GREATER HEIGHTS THAN THE REFERENCE ANTENNA, INCLUDED FOR GENERAL INFORMATION
GAIN - dBd
FREQUENCY - MHz
14.0
14.1
14.2
14.3
14.35
5L KLM YAGI
6L QUAD - 48' BOOM (WB6HSG)
5L KLM YAGI - 40' BOOM (N6PD)
5L YAGI - ?
TRIBANDER 1 (WB6ESQ)
4L YAGI - 30' BOOM (N6NB)
4L QUAD - 30' BOOM (K6NA)
TRIBANDER 2 (N6NB) TH6
3L QUAD 27' BOOM (W6AQ)
2L QUAD (N6NB)
TH-2 (REFERENCE) (N6NB)

At the beginning of these tests, Wayne did a lot of work measuring the gain of Yagis and Quads at VHF and UHF frequencies. He found that the higher in frequency he went the better the Quad performed than the Yagi. It seems that the dipole-driven element of the Yagi is the problem. It is just not as effective as the Quad element. However, by the time the frequency had dropped to 144MHz there was little difference in performance. This seems to indicate that UHF modelling of HF antennas may not always produce an accurate result. Jim Lindsay's W0TH QST article, "Quads and Yagis", of May 1968 presented much data showing that the Quad of any length would out-perform a similar sized Yagi by 2dB in forward gain; Lindsay stated that it would be necessary for a Yagi to have 1.8 times the boom length of a Quad

to equal its forward gain. He based his findings on model Quads and Yagis operating on 400MHz.

Wayne came to the following conclusions:

1. Cubical Quads do NOT "come into their own" at low heights. At any given height, the vertical angle of radiation of Quads and Yagis is virtually identical. The old idea that Quads are better low-height performers than Yagis should be recognised as the myth it is.
2. As the frequency is increased into the UHF region, the performance of Quads and Yagis may not deteriorate at exactly the same rate, given the mechanical differences between the two designs, particularly their driven-element configuration. This creates difficulties that must be accounted for if you wish to generalise about the relative performance of the two antennas at the high frequencies on the basis of UHF modelling.
3. While it may be possible to design a high-frequency cubical Quad with a long boom that will outperform a similar size Yagi by 2dB as Jim Lindsay suggested, no Quad I tested approached that level of peprformance. In only a few cases did a Quad of more than two elements even equal a comparable sized Yagi. In fact, the Quad seems to be better in its two and three-element designs.

   "If this field research suggests that long Yagis are the most consistent high-performance antennas for the serious DXers and contest operators, where does that leave the thousands of amateurs who use trap tribanders? How good are these multi-band Yagis?"

   Perhaps the most notable conclusion, and the least controversial, was that the tribanders sacrifice bandwidth for multiband operation. If adjusted for phone-band operation, there was dramatic gain fall-off in the CW portion of the band.

I have included here the relative gain measurements taken on 20 metres. Some notable points of interest are: the gain of the TH-2 tribander reference antenna and the two-element Quad peak at about the same amount, but the Quad has a much better bandwidth. The tribander number 2 is in fact a TH-6 tribander which is well known in Australia. Note the rapid fall-off of gain at the low frequency end.

I guest that this doesn't answer the question which is the better antenna? But it might give some food for thought. By the way, if you would like to read the full article, I would be happy to send you a copy on receipt of a large SAE.

Just to finish off, the author finishes up with a most interesting challenge. He states, "Bring me a high-frequency Quad of four or more elements that you believe out-performs a comparable-length Yagi. I'll provide two towers in an open field for the side-by-side tests. If your Quad really delivers 2dB more than my Yagi, I'll publicly recant the conclusions presented in this article."

An interesting challenge which, to my knowledge, has not been taken up as yet.

Practical Wire Antennas: effective HF designs for the radio amateur

by John D Heys G3BDQ

A Review

If you read this column, then I could guess that you have a passing interest in antennas. Perhaps, like me, if a new antenna book comes out, you cannot get your hands on it quickly enough. Well, here is a new one that has just become available through Mag Pubs. It's another one of those marvellous books published by the Radio Society of Great Britain. The author, John Heys G3BDQ, has been writing for the amateur radio press for well over 40 years. I have on file many of his articles in the old *Short Wave Magazine* circa 1950. From a look through this book, it's obvious that John has had an interest in antennas for a long while and, perhaps more importantly, an interest in simple (put it up this weekend) type antennas. This is a book devoted to wire antennas, so you won't need to stock up with expensive aluminium tubing to try any of them out. The theoretical side has been kept short and to the point and, for the most part, the book is full of diagrams showing the physical layout of the antennas described; and, in many cases, the directional patterns that might be expected.

Have you ever had an idea on putting up (or down) an underground antenna? Well, this book will show you how to do it, and John even claims that it will work. Most council regulations only cover antennas up in the air, so here is a way to get around that one.

All of the old favourites are covered, and these include Zepps, double-extended Zepps, long wires, loops, delta loops, the T2FD, naturally the G5RV, plus many others.

There is even a chapter on antenna coupling units with both balanced and unbalanced types described. The Z match is described, but only mention of the G5RV modified type is covered. I have tried this one and found that it has no advantage over the standard type and neither is as good as our own Ronony-mous Z match. I guess that John had not caught up with ours when his book was written.

However, if you want to have an excellent reference available when you are contemplating some new antennas, this book is highly recommended.

Check your local Mag Pubs outlet. If they haven't got it, tell them to get it fast. This book is going to be a fast seller.

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Random Radiators *continued from page 9*

The Dick Smith D-5204 four-way coax switch

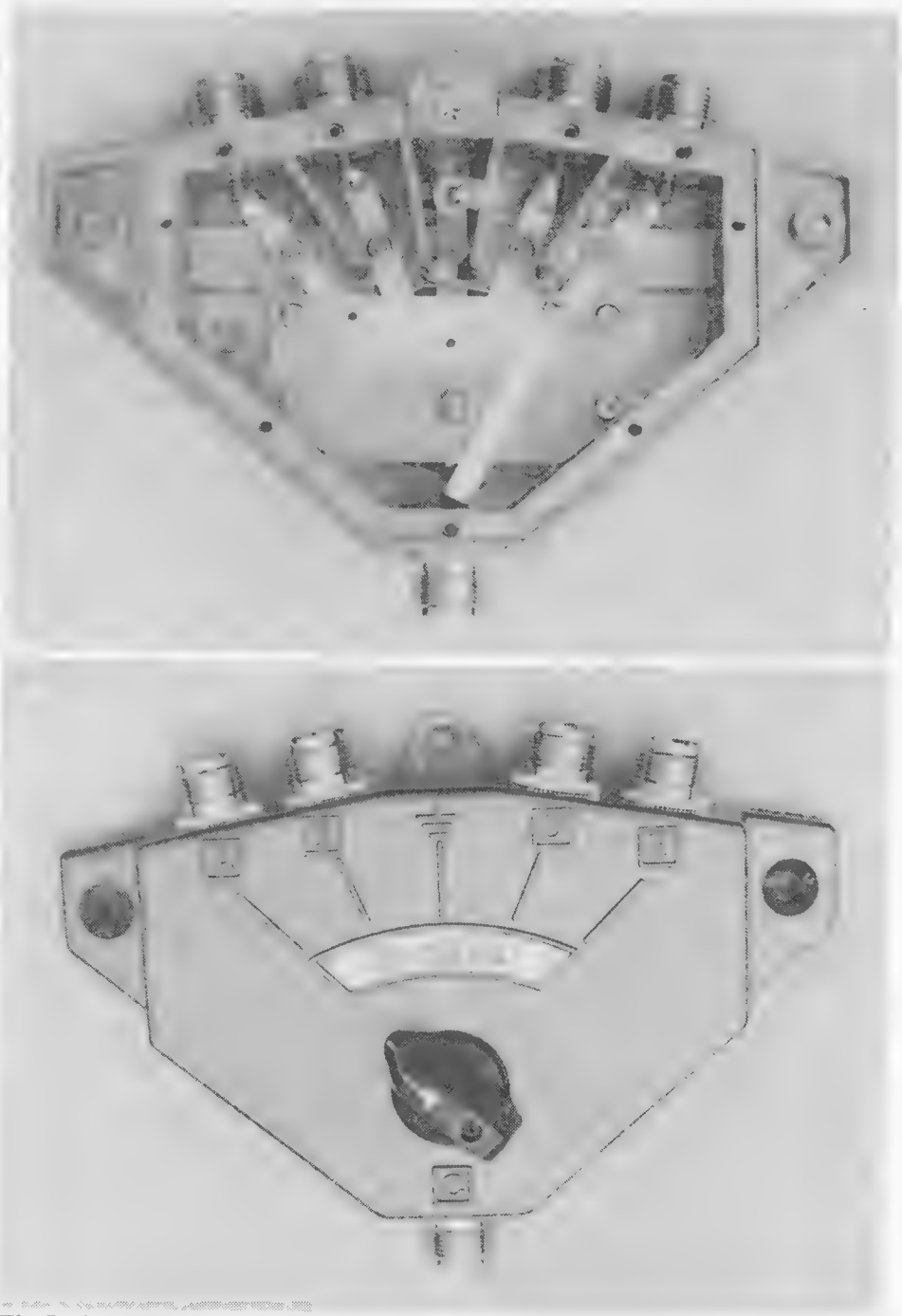
As you might imagine, writing a column like this involves quite a bit of playing around with antennas. You soon find out that some form of switching is required to give instantaneous comparison reports from different antennas. Well, a few weeks ago, my antenna switching system fell short of requirements. I not only have several antennas but also have a choice of transceivers, so some switching is required at each end, so to speak.

The Dick Smith four-position switch appeared ideal. I was even more sure when I found out that the price had been reduced from $99 to only $89. I am not sure if they still are $89, but even at $99 they are excellent value. By the way, if you want to, you can buy the same switch from another well-known distributor and pay $129 for it. Of course it has another brand name on it, but is identical in every other way.

A quick look at the photos will give you a good idea of the construction both inside and out. To say that it is rugged is an understatement. Construction is in solid die-cast aluminium with each output lead formed from a solid-copper strip running through a precision-formed cavity to maintain an exact 50 Ohms. It is rated to carry 2kW of RF power at 30MHz with a loss of less than 0.3dB. Firstly, I would say that this loss figure is very conservative and that the switch will operate well into the VHF region with very little power loss. Two safety features are built in. Firstly, there is a centre switch position that connects everything to earth, and secondly, there is a built-in surge protector which is presumably designed to flash over to earth if a lightning strike occurs nearby. Now here is my only criticism of the switch. Well, not the switch itself, but the information that is supplied with it. Let me re-phrase that. The information that is not supplied with it. What happens if the surge suppressor is hit by a lightning bolt? Does it need replacing? I don't know, and the sparse information on the box doesn't say. What a pity for an otherwise very well presented product.

I should mention that I am only using the switch up to 30MHz where it selects two rotary beam systems and various wire antennas fed via a Z match coupler and an old Johnson Matchbox coupler.

Now don't gorget, make sure you get your switch from Dick Smith and not that other distributor who sells it under a different name at about $30 or $40 more.



The Dick Smith Coaxial switch

SEQATV Group Two-way Hook-up

LAMINGTON NATIONAL PARK 75TH ANNIVERSARY
RICHARD CARDEN VK4XRL
227 RODE RD
WAVELL HEIGHTS 4012

THE LAMINGTON NATIONAL Park is situated near the south-east corner of Queensland on the border of NSW. Within the National Park, there are two privately owned and run resorts, these being Binna Burra and O'Reilly's. The O'Reilly's Resort is known for its connection with the crash of the STINSON in 1937 when survivors were found by Bernard O'Reilly.

On Saturday 4 August 1990, the National Park celebrated its 75th anniversary. To mark the occasion, the Queensland National Parks and Wildlife Service arranged for events at both resort sites. The SEQATV Group was approached to provide a two-way hook-up between resorts. Initial testing was carried out by Richard VK4XRL, Brian VK4BDB and Bob VK4BOB some six weeks before the event to find out the feasibility of the required hook-up. These tests were carried out using 426.25MHz from Binna Burra to O'Reilly's. The test provided only a P3 picture, but moving the equipment at Binna Burra to behind the guest house improved the results to a perfect P5. The biggest problem was that a ridge runs between the two resorts. Also, at the Binna Burra site we could not provide any real height. Pictures were also exchanged with Brisbane on 426.25MHz with excellent P5 results.

Armed with this information it was decided to go ahead with the project. Richard VK4XRL detailed a plan and further tests were carried out some two weeks before the event.

The proposal put forward to the group by Richard was as follows:

(1) Binna Burra to O'Reilly's – 1250MHz FM-ATV
(2) O'Reilly's to Binna Burra — 444.25MHz ATV

and as an added bonus it was decided to feed this signal to the input of our Brisbane ATV Repeater VK4RTV.

Two 70cm antennas feeding a splitter unit were used to feed the 444.25MHz ATV signal to Brisbane and to Binna Burra. The 1240MHz FM-ATV equipment was built by Richard VK4XRL and provided the Binna Burra site with about six watts into a 30-element yagi antenna. The FM-ATV receiver was fed via a dual-quad antenna which provided a gain of about 10dB.

These tests were carried out on 15 July 1990, but a few problems had to be sorted out as the sites envisaged by the National Parks and Wildlife Service could not see each other. With some co-operation from the two guest houses suitable sites were found. Tests were carried out and provided P5 pictures to Binna Burra and P4 pictures to Brisbane via our Repeater. The 1250MHz FM-ATV link only provided a P3 picture with some fading. However, with co-operation from the resorts and the National Parks and Wildlife Service, another technical meeting was arranged and discussion took place on the problems at each of the sites. As no further tests could be carried out before the event a fallback situation also had to be planned. Three fallback situations were proposed:

(i) Provide a 579.25MHz feed from Binna Burra to O'Reilly's — this could have caused problems as we could already see our repeater at this site; however, we could use vertical polarisation — so with this in mind the DoTC was approached to use this frequency during the weekend.
(ii) Use 426.25MHz from Binna Burra to O'Reilly's — this was also a problem as we were also transmitting on 444.25MHz; however, with careful antenna aiming and a couple of filters it was felt that it could be done.
(iii) Use 444.25MHz or 426.25MHz from Binna Burra and O'Reilly's and switch off the TX system which was not being used at the time.

The main approach, however, was to proceed as in the tests but upgrade the 1250MHz FM-ATV link by increasing the output power to approximately 18 watts. This was achieved and tested the week before the event. Also Brian VK4BDB provided a second 30-element yagi from his antenna farm to receive the signal. Extra height was also provided at the receive end.

The block diagram shows the final set-up for the two sites. Continued transmission was to be provided from O'Reilly's with switching across to the Binna Burra site when required.

Setting up was carried out on Friday afternoon, 3 August, with perfect 1250MHz, 444.25MHz pictures between the sites and to our repeater in Brisbane. All events proceeded over the next few days without a single technical hitch, and VK4BTV closed down transmission on Sunday 5 August at 11.30am.

A great time was had by all but it could not have been done without the co-operation of the Resorts, National Parks and Wildlife Service, Rangers and the SEQATV Group. I would like to thank those at Binna Burra, VK4ADN Bob, VK4YAR Alan, VK4ZWJ Bill and VK4XRB Richard, and at O'Reilly's VK4BOB Bob, VK4BDB Brian and YL Robyn. Also, a special thanks to DoTC for approving the use of 579.25MHz ATV and for allowing the club callsign VK4BTV to be used portable from both locations. Thanks also to Don Marshall VK4AMA and the National Parks and Wildlife Service, Vince and Peter O'Reilly and the people at the Binna Burra Resort for letting us use their facilities.

Again, many thanks for an effort well done. **ar**

(See block diagram overleaf)

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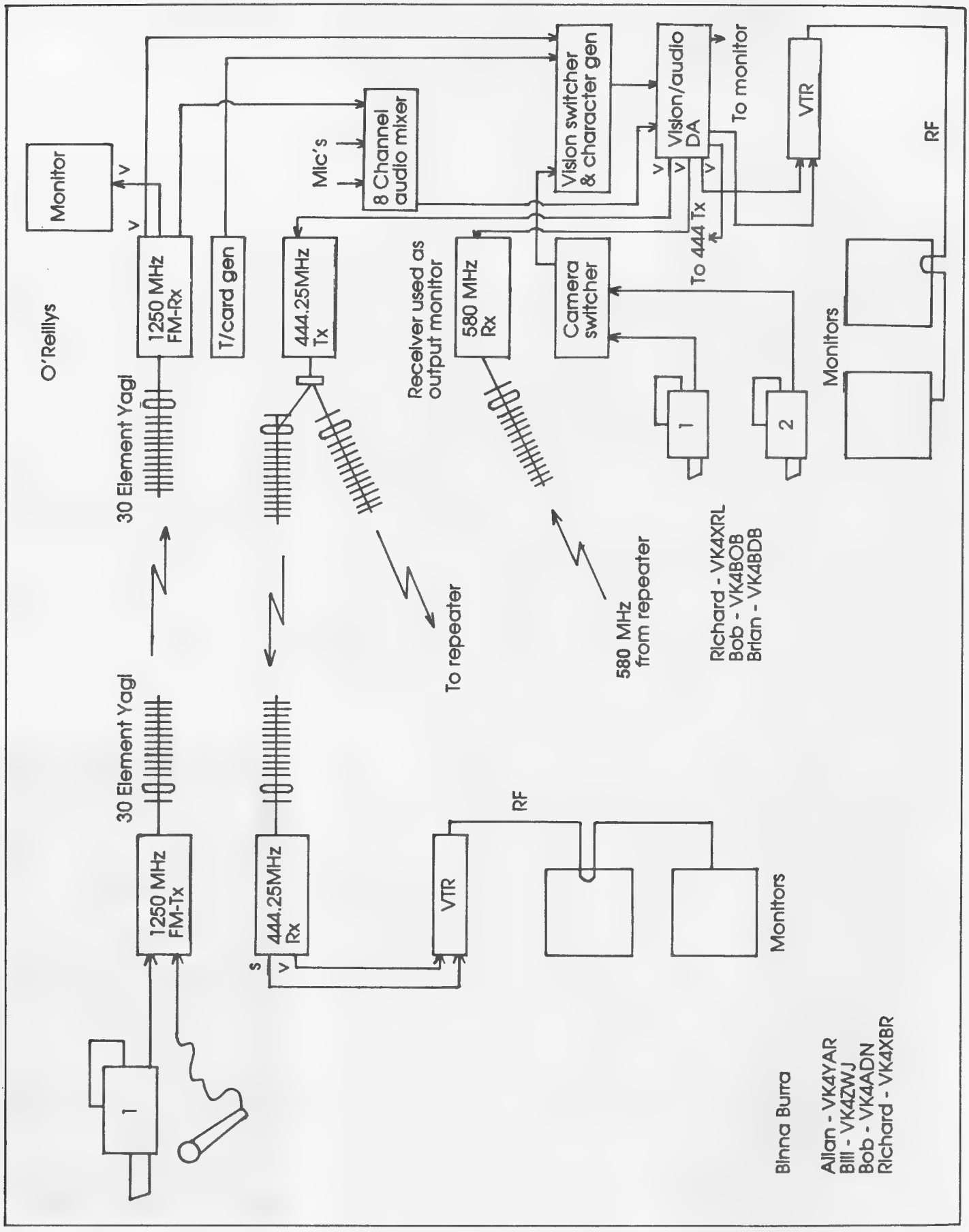
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Brian - VK4BDB
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Binna Burra
Allan - VK4YAR
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Right Angled Delta Loops for 20m

FELIX SCERRI VK4FUQ
9 GARBUTT ST
INGHAM 4850

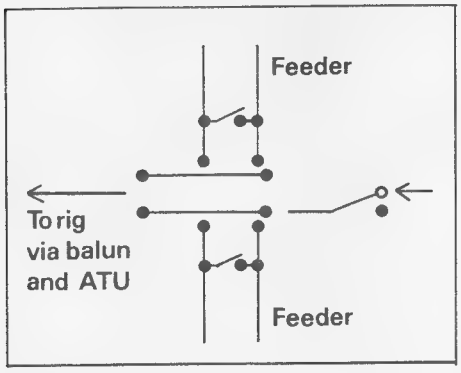
LOOKING THROUGH OLDER editions of *AR* and noticing many antenna contributions has prompted me to present an antenna article of my own. Only brief constructional details will be given, but it is hoped they will be sufficient. The antenna is basically a *"right-angled delta loop"* designed for the 20m band.

Essentially the title is self-explanatory. The array consists of two one-wavelength loops positioned at 90° to one another, the idea being that each loop is switchable at the ATU to give directional shift.

Each loop works individually. It is not a parasitic array. (Not a disadvantage as it turns out). At my Ingham QTH, the two loops are suspended between three pipe masts (about 38-40ft high), the centre mast being "common" (see diagram).

Incidentally, the masts were easily "walked up" into position by two people. Individual setups may make use of existing anchor points. Whatever is used, safety-first, please. I speak from experience. Three and three-quarter months in hospital ain't no fun!

The use of pulleys and polythene cord makes raising and lowering easy, and results in excellent electrical insulation. The lengths of the loops are given by the standard formula L(ft)=1005/ f(MHz). This is close enough. Use a GDO or noise bridge, if you want, but remember if you have to lower the loops to do measurements, then the apparent resonance will shift down about 150kHz. Be aware of this. Small plastic insulators are placed at the appropriate 1/3 points to provide connection points to masts and form the delta shape. Apply adhesive to the wire loop at the insulations to avoid slippage.



Switching system for feeders

Feed takes place at the bottom of the inverted triangle direct with 300 ohm ladder feedline. Various different feed points have been tried over the years, but bottom feed appears to give the best results. Once everything is in the air you should have two majestic loops at 90° to each other. As part of switching at station end, some means of "shorting" the feeder of the unused antenna should be incorporated to reduce interaction.

Another question may now arise. How much separation should there be between loop ends at that "common" mast? Tests seem to indicate the more the better, although interaction seems minimal when spacing is only 3ft or so from mast. Interaction between loops and the masts may also occur at close spacings. This, indeed, was the case at this QTH, resulting in some strange effects, including increased noise pick-up.

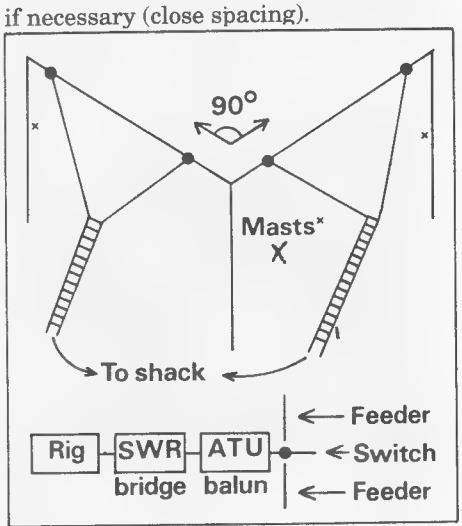
During recent experiments, an effective solution was found, although, to be quite honest, I can't say why. The use of "resonance breakers" in a variant form seems to work nicely. In my set-up, the breaker consists of an L-C network made up of a 200pF variable capacitor and a 2ft length of insulated wire, with two or three turns wrapped around the base of each mast, resonated with a dip meter to mid-band. These devices appear, somehow, to greatly reduce the mast/loop interaction quite conclusively, although the mechanism of operation is not clear.

Building the array is relatively easy; tuning it is the hardest part. In order to make each loop "track" with the other, when switching, it is necessary to use equal lengths of feeder to allow the same ATU setting on each loop. This can be something of a pain to achieve; perhaps the easiest way to do this makes use of the dip meter using one loop/feeder combination as reference, the "resonant" frequency is measured, then the other feeder is trimmed (or lengthened) accordingly, until a dip is noted at the same frequency. Very close "matching" can be achieved with patience. Note that the dip frequency may be nowhere near the true antenna resonant frequency, depending on feeder length. Such is the nature of open feeders (but they are great feedlines). Remember to use a good quality ATU and balun, correctly tuned to let the rig see 520 ohms unbalanced.

Final conclusions: How does it work? Bewdiful! The ability to switch direction instantaneously is enormously useful, especially if you participate in contests Apart from this advantage, in other respects the antenna is a superb performer. Transmission and receiving capabilities are very high indeed. Almost embarrassing actually, when reports you get are as good as stations using yagis and the like. Maybe that says a lot about the performance of the average yagi!

But, enough of that. I know this array is a fine antenna. Should you also build one, I know you will agree.

Note: Do not "hot switch" antenna
Use resonant breakers on mast bases, if necessary (close spacing).



Antenna arrangement and method of connection

Getting Started with Amateur Radio Satellites

Part 2

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IN JANUARY WE COVERED some introductory topics and talked about terms like Doppler shift, polar orbit etc. Our flavour of the month satellite was DOVE and we set up a simple receive station to listen to the telemetry and digitalker. I hope you had some luck receiving its signals. there were plenty of opportunities and signals have been good.

The topic this month is orbital geometry and our flavour of the month satellite is UoSAT-2. Don't be put off by the geometry bit. I'm not going to send you all off back to school to study maths. It's just that there isn't any better way to describe it.

If you're going to pursue an interest in amateur satellites you'll need to get a clear picture in your mind of what's actually happening up there. Try to visualise the Earth as seen from the moon. Hold up a globe if you have one. Spin it on its axis. Imagine, or even make, a loop of wire about a centimetre bigger in radius than the globe. Put it around the globe so it passes over the North and South Poles. This represents the path of a satellite in a 'low Earth, polar orbit'. Think of the sun as being over at the other side of the room. Hold the wire loop steady and rotate the globe inside it, from west to east remember. As the satellite model makes its way around the wire it passes over a different part of the Earth on each orbit. If it's high enough, and they all are, it will 'see' every point on the surface of the Earth twice a day, every day. This is the big advantage of a polar orbit. No-one misses out. All the UoSats, all the microsats, the JAS (Japanese) and RS (Russian) satellites are in this type of orbit.

There are other advantages in using a polar orbit. The Earth orbits around the sun, I'm sure you're all aware of that. If we can organise the orbit of the satellite to creep a bit each day in the opposite direction, and if we can be really clever and organise this creep to be about one degree per day, then the sun is always going to 'see' the satellite for the same length of time each day. This is very important when the designers are working out how much power they have available from the solar cells. Such an orbit is called a 'low Earth, polar, sun-synchronous orbit'. It also means that the satellite will pass over the same places at roughly the same local times each day regardless of the seasons.

Our flavour of the month satellite, UoSAT-2, is in such an orbit. I've chosen it for a number of reasons. Like DOVE it's not a communication satellite. You can't talk through it. It's an experimental, educational satellite, and that's what we're on about at this stage. Uo-SAT-2 is the second in a series of these education-oriented birds which are being designed and built at the University of Surrey, England by a team of researchers headed by Dr Martin Sweeting G3YJO. The program began in 1979, and UoSAT-1 was launched in October 1981. Two more were launched in 1990.

These satellites have all sorts of clever stuff on board. Things like a navigational magnetometer for measuring fluctuations in the Earth's magnetic field. A cosmic dust particle detector, electron spectrometer and so on. Of more interest to us at the moment are the beacon transmitters.

These transmitters operate on 145.825MHz (same as DOVE), 435.025MHz and 2401.5MHz. The normal frequency is 145.825MHz. You can listen for UoSAT-2 with the same gear I described last month. Its orbital period is one hour, 38 minutes, 16 seconds at present. It comes around during roughly the same time window as DOVE. UoSAT's telemetry sounds similar to DOVE but the buzz is more regular and the off-times are shorter and less frequent. Like DOVE, UoSAT-2 has a digitalker. When it's operating it gives out telemetry data in a rather mechanical sounding voice.

Let's think now about the next best value upgrade of our simple satellite station. Probably the most valuable tool you could acquire would be a computer, but we're not far enough down the track for that yet. We first need to improve the strength and therefore the quality of the received signal. The best computer and decoder won't help if the signal you're receiving just isn't strong enough. Later on we'll be discussing techniques for extracting data from noisy signals, but there's a limit to everything. I think the next thing to do is to try your hand at tracking the satellite across the sky using a small, low-gain Yagi beam. This may seem a strange thing to suggest if you don't have a computer to tell you exactly where the satellite is in the sky, but read on.

A small, say five-element Yagi beam on 2m is easy to build. Any good antenna book will have details. I have one which I mount on an old photographic tripod, one with a ball joint mounted on top. By putting a small amount of tension on the ball joint, the beam can be aimed by hand anywhere in the sky, except perhaps directly overhead. You could even do that if you gave it a little thought.

The Yagi will give a valuable few dB of gain but will probably have a half-power beamwidth of 40 degrees or so. This will mean that pointing is in no way critical. You will easily be able to find the satellite and keep the antenna aimed at it by watching the S-meter or just listening to the signal. This can either be a two-person operation or you can take the receiver (and recorder; it's a good idea to record the sigs) outdoors. It's not a bad idea to get as close to the antenna as possible anyway. Keep the feedline as short as you can and, like I said last month, use your best co-ax.

You should be pleased with the improvement in the performance of your station now and with practice you ought to be able to get excellent signals down from DOVE and UoSAT-2.

I'm going to ask you now to go back to the globe of the Earth. I want you to start thinking about some other possible orbit shapes and their characteristics. Lots of commercial satellites are in low Earth, near circular orbits. Landsats, navsats, weathersats, SPY-SATS. Most are around 500 to 1000km altitude and have orbit periods of an hour and a half or so. If you

continued on page 18

Equipment Review
The Kenwood TM-701A and the TM-731A Dual Band FM Transceivers

RON FISHER VK3OM
GAALANUNGAH
24 SUGARLOAF ROAD
BEACONSFIELD UPPER 3808

That's right! Not one but two transceivers for our review this month; these are both dual-band FM transceivers that cover both the 144 to 148MHz and also the 430 to 440MHz bands. The 731A has a nominal power output of 50 watts on the 144MHz band and 35 watts on the 430MHz band, while the 701A has an output of 25 watts on both bands. However, back to the beginning. In the April 1990 issue of *AR*, I reviewed the TM-231A 2m FM transceiver. I guess the best way to describe the 701A is to call it a dual-band version of the 231A. It has the same general appearance and is of the same overall size. However, it does have two coax output connectors, one for each of the two bands. The LCD multi-purpose read-out gives all the information you might need, but it only shows the main operating frequency. The 731A, on the other hand, not only shows both the 2m and 70cm frequencies, it also has two S-meters. Just consider that — not even the new TS-950S has that facility! The 731A also has two coax output connectors, so you will need either two separate antennas or a diplexer if a dual-band antenna system with a single feeder is used. If you are a casual FM operator, the latter approach is probably the preferred way to go. By the way, if you have noted that the price of diplexers is rather steep, don't worry — I will be covering the construction of one in Random Radiators very soon. Total cost about $20.

With the bigger display and increased power output, the 731A is a bit larger than the 701A. In fact, it measures 150 x 50 x 219mm and weighs in at 1.8kg, compared with 140 x 40 x 200mm and 1.4kg for the 701A. Also for the extra size and cost, you get a few interesting features included. A squelch control for the sub-receiver and a balance control to set the relative audio outputs of each receiver. It is also possible to run two external speakers, one for each band. Without external speakers connected a mix of the audio is supplied to the internal speaker. Both transceivers have their internal speakers mounted in the top of the cabinets. I feel that, in general, this is the best place for them, although care needs to be taken when mounting the rigs in the car to avoid masking the sound.

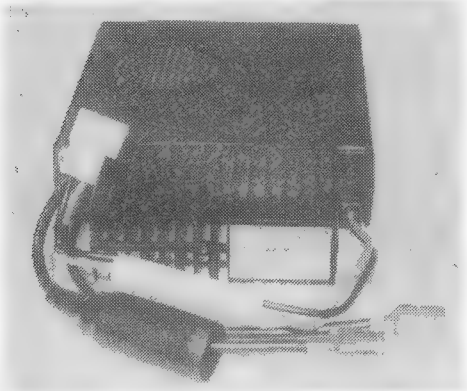
The TM-731A – a Closer Look

I will take each of the rigs separately and cover the various features that they have.

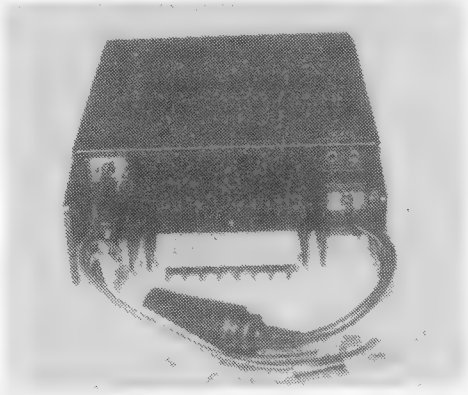
The tuning facilities on the 731A are very comprehensive. There are two tuning controls, one for main tuning and the other for 'sub' band tuning. This means that each band can be tuned independently of the other. These same controls are also used to select the memory channels when operating in the memory mode. Underneath the main tuning control are two up/down buttons which step the main tuning in one MHz segments.

Tuning steps can be programmed for 5, 10, 12.5, 15, 20 and 25kHz, with a separate choice available for each band. Thirty memory channels are available and these are divided equally between the two bands. One of the memory channels on each band is allocated as a call frequency. Memory channel 'one' is allocated for the special alert function. If your call channel corresponds to the one you require the alert function to be on, then you will have to have the same frequency in two memory channels. This means that you might well run short of memory capability. It seems odd that many handheld transceivers can run to 50 or even 100 memories, and yet a full-featured transceiver has only 30 (or less). Some of the memories are also designated for other uses, such as band scan limits and offsets other than the standard ones.

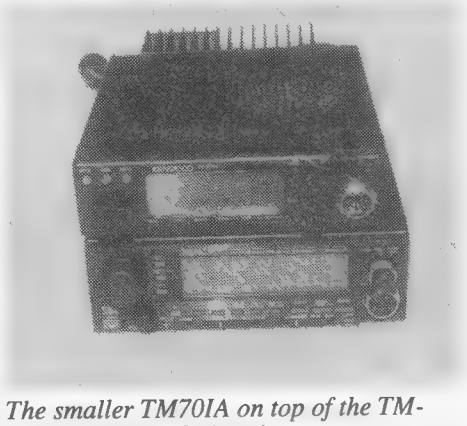
Many of the control buttons are dual purpose, with the second function coming into use with the operation of the function button first. Luckily, most of the



Rear view of the TM-701A. Dual coax output leads can be seen which are not identified on the name plate.



Rear view of the TM-73IA. Note the two speaker output sockets at top left.



The smaller TM70IA on top of the TM-73IA note the relative sizes.

'second' functions are of the set-and-forget type. In general, the ergonomics are very well thought out, but the combination of small buttons, small labelling and my bi-focal glasses made it rather hard to hit the right button every time. No doubt, given time, I would have become familiar with it all. The microphone supplied with both rigs is one that has come in for some adverse comment (not from me). It has a 1mm hole for the microphone acoustic input. It has been said that this is too small. I did many tests and comparisons with other Kenwood microphones and must say that it came out sounding better than most.

Power output on transmit was well up to spec on both bands, but it was interesting to note that the current drain was higher on 430MHz, despite the lower power output, indicating a somewhat lower efficiency on the higher band. The output was well maintained right across both bands.

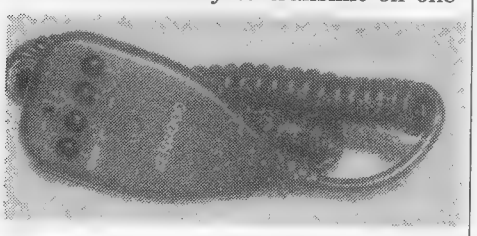
Current drain	146MHz	435MHz
	7.6 amps	8.6 amps

In the lower power position, the power output was just on five watts on both bands with a current drain of 2.7 amps on 146 and three amps on 435MHz.

Receiver sensitivity appeared to be excellent, with only 0.1μV input required to produce a 12dB sinad on 146MHz. As I am not blessed with a signal generator covering the 430MHz band, I can only guess, but it appeared to be just as good, easily beating my old (and little used) transceiver. No reciprocal mixing problems were noted on either band and, as I have a police UHF repeater less than 100 metres from my antennas, this certainly indicates first-class front-end performance. Receiver audio power output was measured at 2.9 watts into an 8-ohm load and a very healthy 4.8 watts into a 4-ohm load. Audio quality was good, but with a little less low frequency response than I have found with Kenwood VHF gear previously.

The 'S' meter was checked on 146MHz only, and it was noted that 14dB increase in level was required to go from S1 to S9 with another 6dB required to get to the top of the '+' section. This is certainly better than most, but don't give antenna reports on the basis of 6dB or even 3dB per 'S' point.

With the ability to transmit on one band and listen on the other at the same time, you are set for versatile operation. Just one point, however. If you intend to do much duplex operation, headphone use is almost mandatory. Perhaps on the next model, Kenwood might like to consider putting a 3.5mm stereo headphone socket on the front panel.



The somewhat controversial microphone which we found to work very well. Note the remote control buttons.

The TM-701A — A Closer Look

Basically the 701A is smaller, has less power output and a few less features compared to its big brother. Let's see first off what you don't get. As mentioned earlier, the read-out is much smaller. The second, or sub-frequency, read-out is not provided, neither is the second 'S' meter. The transmitter power output is lower on 144MHz, 50 watts down to 25 but, in fact, is not that much lower on 430MHz, 36 watts down to about 25 watts. Not enough to make any real difference. The sub-tuning control, the audio balance control and the sub-band squelch control are all missing. However, there is one thing the 701A has that the 731A does not have: a power on/off switch which is not combined with the audio gain control. You can leave the audio set to a suitable level — very handy.

The 701A also has that handy facility of being able to select the VFO tuning rate. I feel that the 25kHz rate is the best choice as it fits our band exactly.

With the rig on test, I was unable to pick very much difference between the two rigs apart from the higher power output of the 731A. The specification of the 701A indicates that the receiver sensitivity is a fraction down on the 731A. However, my rather ancient test equipment was unable to pick this up. On-air tests were unable to show up any detectable difference in receiver performance between the two rigs. Probably the main difference is the ability of the 731A to receive two bands simultaneously. The 701 does not include this feature. On VHF/UHF this is not quite the same as the new dual-frequency HF transceivers, because I would guess that most amateurs would use the facility to perhaps monitor a simplex or repeater channel waiting for an unexpected call to come along. If you can listen to and comprehend two transmissions at the same time, you are better than I am.

Of course both rigs are capable of operating in full duplex mode. In other words, you can transmit on one band and receive on the other at the same time. One thing that might deter this, however, is the transmit duty cycle, which is rated at one minute transmit to three minutes receive. I feel that this might be a bit on the conservative side, but both rigs do get hot after a few minutes of transmission. If you intend to operate duplex, it might be a good idea to let the button go from time to time.

Kenwood offers a wide range of optional equipment to complement the two transceivers. There is a variety of external speakers suitable for both mobile and fixed station applications. There are also AC power supplies available, but actually all are designed to match HF equipment. While quite suitable electrically, they do not match the colour or appearance of these transceivers. There is also the interesting RC-10 remote control unit. The photos I have seen of this seem to make it look like a cellular phone unit. Buy one and impress your non-technical friends. But I feel it could actually be a very useful thing to have. What about sending one down for us to review one day?

The Instruction Manuals

Unlike the TM-231A, reviewed April 1990, the books for our review transceivers were not published in six languages — only English. Again the technical information is very limited, with only a circuit diagram included. I know that we reviewers keep on about this, and I hope that one day we might see some results. There is no doubt that some manufacturers are better than others but, in general, the instruction books are aimed at non-technical buyers. No doubt, Kenwood will have a full service manual available as an option, but often these are oriented quite the other way. In other words, if you are looking for basic adjustment information it's hard to find the trees for the woods.

The TM-731A and the TM-701A Conclusions

It's an interesting choice. If you require a full-featured dual-band transceiver, one that can produce double talk and even have dual 'S' meters to tell which is which, and one which feeds the double talk to separate speakers (now single talk twice) then the 731A is for you. However, if you are normally a 2m operator who would like to keep up with what's going on on 70cm, then maybe the 701A is the one for you. Both are rather short on memory space; a thing that I find strange in this day and age. For the features included, both represent very good value. The audio quality is, as usual, pure Kenwood — in other words, the best in the business. I would be happy to recommend either transceiver.

My thanks to Kenwood Electronics Australia for the loan of the review transceivers. If you require more details on price and delivery, you should contact Kenwood or one of its local agents. **ar**

Amateur Radio and the Persian Gulf

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GLEN FORREST 6071

RECENTLY AMATEUR radio has been used to help out in the conflict in the Persian Gulf.

WA5DXP Jim, a friend of mine who was a radio officer on board a cargo ship plying between the US and Japan, suddenly went off air after being a daily AMTOR contact. W5KSI Angelo, living in New Orleans, Jim's QTH, was also a daily contact with me here in VK6. He told me that Jim had been drafted, so it was a surprise when, on 12 November 1990, I received a call from Jim; not a good link, but he managed to tell me that he was a radio officer aboard the American hospital ship *USNS Comfort.*

The next time Jim WA5DXP managed to link with me was to my mailbox on 13 and 15 November 1990, short path from the Gulf. Conditions were good, but a link was hard to establish. I suggested that he check his delay timing as it seemed to be out. The next contact with a very good link was on 21 November 1990 at 1700 UTC. This again was a message into the mailbox. However, unlike the past contacts, this one was good and traffic smooth. According to Jim, it was the navy radio gear that he had been using which wasn't up to the faster switching time required for AMTOR, and he had now been given permission to use his own rig, which he had taken with him.

In my contact with WA5DXP on board ship at 1945 hours UTC on 23 November 1990, the link was very good and traffic flowed very quickly. Jim proceeded to tell me what was happening on board about third party traffic to the States. It seems that three radio hams were drafted from their jobs to be part of a team aboard the hospital ship *Comfort.* Their jobs were the manning of normal ship's radio communications including satellite communications between ships, and the passing of 'third party' traffic from the ship's crew and their families via hams in various part of the US and other countries. Jim was already passing messages for his wife in New Orleans via my mailbox and W5KSI, who collected them each day. The ship's captain authorised times for traffic to be sent either AMTOR or SSB. Authority for third party traffic was allowed only while the ship was at sea When the ship was positioned back in Bahrain, no amateur traffic was allowed from the ship.

Jim also told me that there was an Australian medical detachment aboard his ship which would like to pass traffic to relatives in Australia, and could I find out if it was possible to pass traffic? I decided to ring the PR officer at Garden Island here in Perth to make sure I wasn't breaching any security regulations about the detachment over there. The PR officer said he would check and call back, which he did about 15 minutes later, saying there had been a press release about the medical detachment on 6 September 1990, and therefore there was no secrecy involved. However, at 1430 hours local time, I received a telephone call from the Department of Defence (Security) advising me NOT to proceed with any passing of traffic from the Australian detachment to anyone in Australia. The main reason given was that traffic could be intercepted by parties unknown and information of telephone numbers, addresses etc could be used to trace the families, and methods of harassment would or could be used against them. On passing this information to Jim WA5DXP, it seemed that the ship's captain could not understand why the Australian detachment was to be penalised by not being allowed by the Australian authorities to use the system provided for them. The only other contact the Australians had was by telephone using MARISAT communications, costing them approximately $9 per minute, which they had to pay personally.

On hearing from Security the advice not to proceed with the third party, I then decided to speak with the president of the WIA West Australia, VK6KWN Alyn Maschette. Alyn rang the DoTC and tried to contact the Minister of Defence, but was advised by the Department to put it in writing. This was done without delay; a letter was sent to Senator The Honourable Robert Ray on 25 November 1990, advising the Minister of our problem, with a copy to the DoTC for information.

Daily telephone calls to the Department of Defence (Security) here in Perth, asking if any decision had been passed to them from Canberra, became routine — 'Sorry, nothing yet." On 30 November 1990, Jim again called me from the ship (he had been off air while the ship was in dock taking on supplies). This contact was on SSB as he was at the time passing messages via phone patch to the US. During a break he asked for a progress report, referring to the long-awaited authority to go ahead with phone patch for the Australians aboard. When I advised him that there had been no reply, he said that the detachment commander was most upset and that the ship's commander had sent a signal to Canberra to chase it all up.

The next day while in contact with the ship on AMTOR, I suggested to Jim that we should devise a code for him to pass me the telephone number of one of the nurses from Perth and, during the next few nights' contact, I eventually had the telephone number and name of the nurse. I rang her mother here in Perth and suggested that she and her husband came to my home for a chat. That night they arrived and made a tape recording for their daughter, who had been making arrangements for her wedding in Perth prior to her going to the Gulf. These arrangements had been postponed. During my contact the following morning, I passed the tape over the air to Jim, who recorded it and passed it over to the nurse, Captain Marina Godfrey, who was thrilled to hear her parents on tape with information about her new wedding arrangements.

Then Jim went off air again until 16 December 1990, for operational reasons. During this time, I asked around if anyone could lend me a phone patch. Dave Wallace VK6IW had a Yaesu SP101 which he said he wasn't using and was mine for as long as I needed it. On 17 December 1990 I was awakened by my "sysop" alarm at 0400 hours local. I staggered out of bed to find Jim was calling me in AMTOR and asking me to go to SSB. On SSB he asked if I could call Marina's mother and patch her through to the ship in 15 minutes time. Well, it was a very surprised mother who woke up to my telephone call at that time, but so pleased, and the call came through with perfect copy. Marina was

able to talk with her mother about all the wedding arrangements etc. After 15 minutes we cut the link to allow other calls to be made to the US for other members of the ship's crew.

Various contacts were made with Jim up to 21 December 1990, then communications were once more restricted to operational use only, and were not continued until another call came early morning on 11 January 1991, again over AMTOR. This time Jim advised that, as from 2359 hours UTC 11 January, all amateur communications would be discontinued as the ship was on operations only. I did get to communicate with the new Australian detachment commander for 20 minutes on the keyboard (AMTOR) while Jim was checking out some other calls on MARISAT. Then Jim gave me his thanks for all the help, and we signed off with my best wishes for him and the ship's crew from all here in Australia.

We all know that the allied bombardment started on 15 January 1991, and yes, on 17 January 1919, Alyn VK6KWN received a letter from the Acting Minister of Defence, Gordon Bilney, dated, yes you're right again, 15 January 1991. This letter stated . . .

. . . *"Subject to Minister Beazley's approval, the use of radio facilities on board* USNS Comfort *by Australian personnel, and the conditions under which the radio station is operated, are matter for the ship's commanding officer and the United States Navy. I would expect Australian Defence Force personnel serving on board to comply with USN requirements, including security requirements."*

For those of you who may be wondering why I bothered to check with the Navy before going ahead with the third party calls, (as an ex-serviceman I had this feeling), let me now quote part of the letter received from the Minister of Transport and Communications, Kim Beazley . . .

. . . *As you correctly point out, under conditions applying to the Australian Amateur Service, communications between amateur stations located in Australia and authorised amateur stations aboard vessels, including warships, are permitted. The Third Party Traffic Agreement between the USA and Australia would enable members of the Australian Medical Team serving on the* USNS Comfort *to pass messages back to their families. Nevertheless, where the operation of an amateur station involves military personnel on active duty, the final decision on whether or not such facilities may be used rests with the relevant defence authorities. I understand that in this instance Australian Defence Force personnel would be expected to comply with all US Navy requirements. Subject to the requirements of the vessel's commanding officer and the US Navy and the Australian Department of Defence, there are no reasons which would prevent the Australian Amateur Service from providing communications facilities for these particular members of the Australian Defence Force.*

It seems ironic, now we have the authority to proceed, that radio silence has been enforced until all hostilities are over. However, at least one nurse was able to use the facility to her parents here in Western Australia before her term of duty expired and, having come safely home, did come and pay a visit to my shack to thank me and the WIA for all our efforts on their behalf. I now await the cessation of hostilities to once again contact Jim WA5DXP, WA1QKW Ralph, and W4CQC Don, to know they are all safe again and on their way home.

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Getting Started with Amateur Radio Satellites – Part 2 *(continued from 12)*

have a scanning receiver you could listen for some of them. I'll cover them in a future article.

Rotate your wire orbit model 90 degrees so that it's now around the equator. Move it back towards the poles about 30 degrees. This orbit has an INCLINATION of 30 degrees. That is, its plane has been rotated 30 degrees from the equator towards the poles. The idea of inclination is an important one to get clear in your mind. When we look at computer programs this is one of the critical elements we must update to keep our programs accurate. The space shuttle is in such an orbit. Its inclination is generally around 28 degrees. The Pakistani satellite BADR-1 also had an inclination of about 28 degrees. From the visualised or real model it will be seen that a satellite in this type of orbit does not by any means cover all the Earth. In southern Australia, for example, we would only ever see such a satellite pass low across our northern sky. It would never get more than 20 or 30 degrees above our horizon. Stations in Scandinavia or Patagonia would never hear its signals.

Now here's another important term you'll need to become familiar with. The part of the Earth that the satellite can 'see' is called its FOOTPRINT. The lower the altitude of a satellite, the smaller its footprint will be. No matter how far away a satellite is, it can never see a complete hemisphere. Think about it. Even satellites like AUSSAT that are in a geo-stationary orbit get close but, no cigar.

Now that geo-stationary term slipped right past. Let's get it back and have a closer look. Without invoking Kepler and Newton's laws you can take it from me that the closer a satellite is to the Earth the faster it must go to stay in orbit. If you would like an analogy, think of a tennis ball on the end of a piece of string. Whizz it around your head. Shorten the string and see what happens. Don't try it with a cricket ball!

For example, a satellite at an altitude of 1000km would need to be whizzing around the Earth 13.5 times per day. At 277km altitude it would be going around 16 times per day and that's about it because if it was trying to remain aloft by going around 17 orbits per day it would only be about 13km above the surface of the Earth! It would have burned up long ago. Going out to the other extreme, the moon at a distance of about 380,000km takes 28 days to orbit the Earth. Somewhere in between there must be an altitude which will support a satellite doing one orbit in exactly 24 hours. This turns out to be about 36,000km. If the satellite is moving in the same direction as the Earth and it is orbiting around the equator, it will appear to hang motionless in the sky. It will always be in the same spot to any observer, anywhere. This is called a geo-stationary orbit. Many commercial satellites are in this type of orbit. Things are quite crowded in the 36,000km circle around the equator, particularly over Europe and the USA. Real estate up there would probably put bayside property prices to shame.

It is very expensive to place a satellite in geo-stationary orbit. There are no such amateur satellites . . . yet. But they are being planned.

Next month, a look at amateur communication satellites and the next upgrade of your station.

ar

Have you advised the DOTC of your new address?

SEAnet '90 — The Continuing Saga

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SINGAPORE 9111

THE STORY CONTINUES. Nearly 200 radio amateurs, wives, families and friends enjoyed themselves over the weekend of 9-12 November 1990 at the 18th meeting of the SEAnet Convention. The host society was MARTS, the IARU Member Society for Malaysia, but the venue was Kuching, the capital of the state of Sarawak. Sarawak is located in East Malaysia, and Kuching is around 780km east of Kuala Lumpur as the south-west corner of the island of Borneo. Radio amateurs know the place at 9M8-land.

Reports on earlier SEAnet Conventions have appeared in *AR*, and it is with the hope that further publicity will encourage greater Australian participation that we again report on this fun activity. If you haven't visited Thailand before then maybe you will have a reason — or excuse — to in 1991.

Members of the recently formed Sarawak Amateur Radio League — SARL — formed the organising committee and did a magnificent job of keeping all the attendees happily occupied for the entire weekend. For most delegates it started on the Friday evening and finished on the Monday morning. For some 20 hardy souls it finished even later in the week. But more of that anon.

For those overseas amateurs suitably qualified, and so inclined, it was possible to obtain a 9M8 callsign for the duration of the convention, one indication of several of the ways the Organising Committee had gone about its task of approaching the appropriate authorities to obtain useful concessions. Needless to say there was quite a spate of new calls heard on the especially installed 147MHz repeater, with some new calls appearing on the HF bands as well. Believe it or not, but 9M8 was also on Moonbounce and Satellite as well as on 50MHz (9M8SEA). The operational side of amateur radio was certainly well catered for.

A Technical Symposium under the chairmanship of "Jumbo" Godfrey ZL1HV was held on the Saturday afternoon. Five papers on various topics were presented:

1. "Telecommunications in Malaysia".
   Speaker: Tuan Haji Hod b. Parman, Assistant Director-General of Telecommunications, Malaysia.
2. "Advancement of Amateur Radio in Japan".
   Speaker: Mr M Fujioka JM1UXU on behalf of
   Mr S Hara JA1AN, President, JARL.
3. "Amateur Radio in Malaysia".
   Speaker: Mr D D Devan 9M2DD — Director IARU Region 3.
4. "A Demonstration of the IPS Advanced Stand Alone Prediction System (ASAPS)".
   Presenter: Mr Geoff Robinson, IPS Radio and Space Services, Australia.
5. "Amateur Radio and You".
   Speaker: Mr D H Rankin 9V1RH/VK3QV/9M8QV
   Chairman, IARU Region 3.

These papers held the attention of the more scholarly inclined.

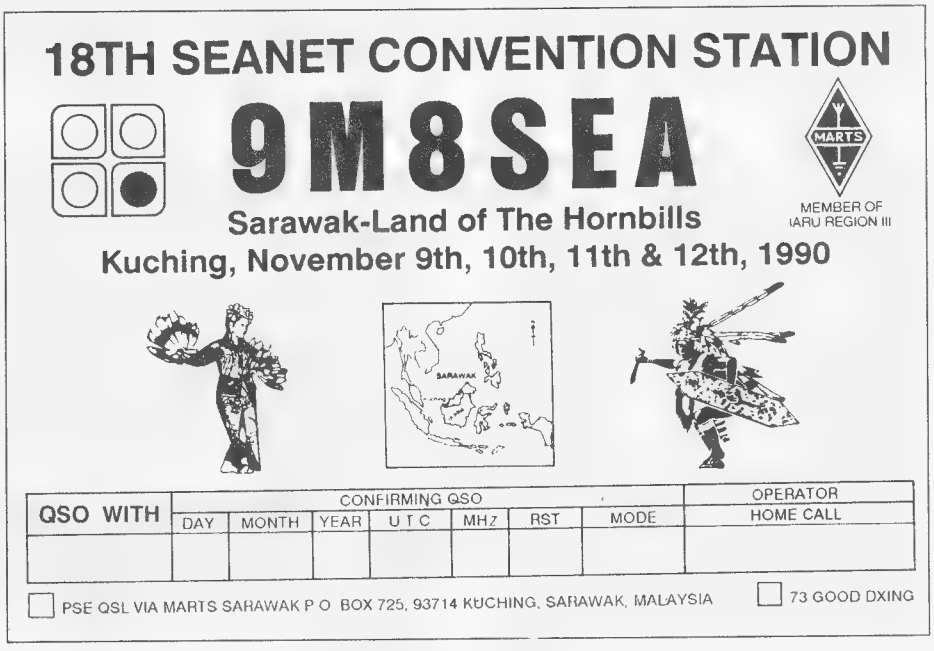
The social side was not overlooked either as the dinners and tour program show. Sumptuous meals, usually Chinese style, with breakfast taken each morning "alfresco" beside the river made sure that none went hungry. Local dignitaries were honoured guests at the evening functions which ensured that they received a first-hand exposure to amateur radio. A number of these guests expressed their surprise at the number of different countries represented within our group — some 16 countries, in fact. They were impressed.

A Sunday cruise, complete with lunch on board a luxury motor cruiser, followed up by a tour of the Sarawak Cultural Village was a most pleasant diversion from the hard work of 'eyeball' QSOs in different languages.

The official headcount as given by Festus Havelock 9M8FH was 191 licensees with the largest contingent not surprisingly coming from Malaysia. The grand total was 91, but it is interesting to note that there were 30 from Sarawak 9M8 itself, and nine from Sabah 9M6. The balance of 52 came from peninsular Malaysia 9M2. Now, as any dyed-in-the-wool DXer will tell you, it is not all that easy to work either 9M6 or 9M8, simply because there are not all that many of these guys or gals around. Let us hope with all this activity with SEAnet there will be some more 9M stations on the HF bands.

The second largest contingent was from

(continued overleaf)



A Message from War-Torn Kuwait

By Jim Linton VK3PC

A ROUTINE READ through an AMTOR mailbox by John Hill VK3WZ found an interesting message from Kuwait, which resulted in him having a hectic two days dealing with the news media.

The invasion by Iraq in August last year of neighbouring Kuwait resulted five months later in the Gulf War. A coalition of some 27 nations was enforcing a United Nations resolution that force be used to get Iraqi troops out of Kuwait. During the first week or so of the Gulf War, constant reports were on news services, including accounts from the Iraqi capital of Baghdad — but little had been heard from Kuwait. Then, via AMTOR, came news of Iraqi soldiers begging for food, and how terrified residents in Kuwait were coping with the war.

John Hill considered this amateur teletype message sent by a Russian radio amateur in Kuwait was newsworthy. He contacted Channel 10, which soon had a news crew at his home to film an item for its news bulletin.

John, in the meantime, contacted the WIA Victorian Division seeking help to achieve a much wider media coverage of the message from Kuwait. This resulted in the story being sent to radio, television and newspapers throughout Australia — and the international news services. John VK3WZ was kept busy with a string of media interviews. An excellent story appeared on page three of the Melbourne *Herald-Sun* in both its morning and afternoon editions.

In his shack is John Hill VK3WZ where he received an internationally newsworthy message from Kuwait during the early days of the Gulf War. (Picture courtesy of Berwick City News).

A local suburban newspaper, the *Berwick City News,* saw this story and decided to do its own version. A reporter had arranged an interview with John at his home — and to help, some background information on the hobby of amateur radio was faxed in advance to the journalist. An excellent story with a photograph shown here appeared on 24 January in the *Berwick City News.*

The outcome of the public relations exercise has been some excellent publicity for our hobby. Congratulations John Hill VK3WC — for helping give amateur radio much needed positive and accurate exposure in the news media. **ar**

SEAnet '90 *(continued from page 16)*

9V1 Singapore, with 33, then the Japanese with 28. Eight and a half amateurs and spouses from various parts of Australia participated; four and a half from VK3, two from VK6 and one from VK8. What happened to the guys and gals from VK1, VK2, VK4 etc, etc? Anyway, how come half a representative? Well, the author claims membership status for both VK3 and 9V1.

A number of presidents of IARU member societies were present — Brunei, Malaysia and Thailand, with President Hara of JARL being represented by Masayoshi Fujioka JM1UXU. In addition, IARU President Baldwin W1RU, IARU Region 3 Chairman 9V1RH and Director Devan 9M2DD attended.

For those with the time, inclination and ability to "rough it out" for a few days, a DXpedition to the Mulu Caves in Northern Sarawak was available. Operation from 9M8ULU took place and a series of adventures really makes this part of the trip a separate story.

All in all, an excellent function organised by a great group of amateurs and aspiring amateurs.

SEAnet continues to operate on 14320kHz +/- QRM every evening at 1200 hours Zulu with rostered net control stations — NCS — such as Albert VK6UA, Hassan V85HG, Ben VK6XC and HS1BV on hand to keep matters running smoothly. Join us on the air sometime and then plan on being in Chiang Mai, Northern Thailand next November for an in-person meeting. Information can be obtained from the IARU host society RAST at GPO Box 2008, Bangkok 10501, Thailand. NCS Albert VK6UA or Ben VK6XC should be able to give some information over SEAnet. So plan now to meet in Thailand in November 1991. **ar**

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The History of the WIA Journal — Part 2

COLIN MACKINNON VK2DYM
52-54 MILLS RD
GLENHAVEN 2156

Continued from Amateur Radio January 1991 Page 21.

From the issue of December 1930, *QTC* was sub-titled "The Proceedings of the Wireless Institute of Australia", a move to upgrade it into the realm of professional bodies such as the English and US Institution of Radio Engineers, which both published "proceedings". *QTC* continued till November 1931, when Leo closed it down, following the decision of the Eighth Federal Convention to make another magazine the official WIA publication, a matter that is discussed later. *QTC* was resurrected some time later as the newsletter of the WIA, Queensland Division and continues to this day.

We now have to backtrack a little to October 1927 when, following problems within the WIA in NSW, amateur radio operators took the lead set by Queensland and formed the New South Wales Radio Transmitters League. The NSWRTL published its own monthly magazine, called *CQ,* from December 1927. It was free to members and edited by J M Bristow 2ZX. The secretary was J Young 2JY, and publicity officer was Don Knock 2NO. Don was also involved in a number of other early wireless publications. *CQ* started with 12 pages containing technical and gossip items and grew to 16 pages. It was small, about 20cm x 13.5cm, and professionally printed with a two-colour cover. The magazine was subsidised by Philips Lamps (A'sia) Ltd, and each issue included information on Philips products.

By August '28 *CQ* was sub-titled "The Acting Official Journal of the Australian Radio Transmitters League", because of support from the other states. But, also in August, the Australian Radio Transmitters League was officially formed with Queensland as its headquarters, so, instead the Queensland magazine *QTC* became the official journal.

When the ARTL and the WIA eventually negotiated a merger, the NSWRTL was recognised as the WIA NSW Division, so the September '29 issue of *CQ* was able to proclaim that it was now "A Magazine issued by the NSW Division of the Wireless Institute of Australia".

Reverting to the Sixth Federal Convention of the WIA in Brisbane during September 1929, NSW proposed that *CQ* be adopted as the official organ for the WIA and Philips agreed to publish the magazine for a period of at least 12 months and would issue up to 1500 free copies of *CQ* each month to all Institute members and nominees. The Institute was to provide a capable editor and all subject matter, but Philips wanted to publish at least one article in each issue describing Philips products.

At this represented a "donation" worth at least 500 pounds per annum, the offer was accepted. Mr Leo Feenaghty, who was the editor of *QTC,* agreed to relinquish publication. It was proposed that the official magazine be renamed *QTC* and that Leo should continue as editor of the magazine, with Phil Renshaw 2DE, the Secretary of the WIA NSW Division, as the assistant editor.

Philips was opposed to changing the name, and discussions with the WIA Federal Executive in Melbourne broke down, causing Philips to retract its offer completely and withdraw funding from *CQ*. Without financial support *CQ* could not continue, and ceased in early 1930, after three years of publication.

The paragraph heading describes these as turbulent years, and now we come to yet another publication which had some claim to official WIA status.

G A Taylor, who was a leader in early wireless organisations, was the editor of the *Radio Journal of Australia,* a short-lived weekly magazine which commenced in late November 1927. It had the imposing sub-title of "Official Journal of the Association for Developing Wireless in Australia, Wireless Institute of Australia NSW Division, Listeners' League (NSW) and Others". With the loss of *Radio Broadcast* as the official WIA magazine, the WIA NSW Division had appointed the *Radio Journal* as its official journal in early November '27, prior to the first issue.

As mentioned, Taylor was very active in wireless matters and was the president of the Association for Developing Wireless in Australia. This organisation was a lobby group to promote commercial wireless for listeners and to give support to manufacturers, and the journal was the magazine of the association. It contained weekly radio programs and news from listeners and amateur clubs, as well as news of the WIA NSW Division. The secretary was Norman B Rydge of later publishing fame.

The magazine's first issue was in November 1927 and it ceased publication a few months later with the March 1928 issue. By that time the WIA in NSW was virtually defunct anyway.

The next magazine to feature in WIA history was *The Radio Review of Australia,* published by Oswald F Mingay. Mingay was an early amateur (callsign 2XX) and one of the pioneers in radio development in Australia through to WWII. Depending on one's outlook he was a benefactor to the amateur movement or an opportunist who sold out the WIA!

This particular magazine was his first of many ventures in publishing, and had "the aim of presenting a record of radio engineering in Australia". The first issue was in April 1931, with 50 small pages for 1/- and was published by Mingay on behalf of Australian Radio Publications in Sydney. At the time Mingay was secretary of the NSW WIA and, whilst supporting the WIA, the magazine was privately owned by Mingay.

It listed as part of its contents "Proceedings of the Wireless Institute of Australia". Perhaps someone objected to the scope of that claim to represent the WIA Australia wide, because the July '31 issue only asserted to present the 'Proceedings of the WIA (NSW Division)". The magazine contained highly technical detail of commercial wireless equipment and installations, very similar to the format of the later proceedings of the IRE. With the October '31 issue the name was changed to *Television and Radio Review* and the price reduced to 9d, although the number of pages dropped to 34, with eight pages devoted to the amateurs.

At the Eighth Federal Convention of the WIA, held in Sydney during October 1931, it was finally agreed that this magazine, *Television and Radio Review,*

would be the official organ of the Wireless Institute throughout Australia.

Remember that in the period from July 1927 to June 1929, the typed and roneoed 12-page leaflet *QTC* had been the Queensland amateur journal and then from July 1929 it became the Official Organ of the WIA. The Eighth Federal Convention considered that the appearance and scope of the Institute's journal should be improved and Mingay offered to include *QTC* as a supplement in his magazine and to change the name to *Television and Radio Review and QTC,* with the hope that Leo Feenaghty would continue to edit the QTC portion. Feenaghty declined and suggested that from December 1931 *QTC* would cease and all subscriptions would be transferred to the *Television and Radio Review*. Whilst not wishing to work for another editor, Feenaghty did in fact contribute an article to this new WIA magazine.

Television and Radio Review of Australia (note another name change) of December '31 now proclaimed that it was the "Official Organ of the Wireless Institute of Australia", with Mingay as managing editor and R Chilton VK2RC as his assistant editor. Each issue contained about one page of WIA news from each Division.

Two worrying events for amateur transmitters occurred around this time. Firstly it was ruled that the Electrical Contractors and Electricians Licensing Act, 1924-28, prohibited **anyone** working on electrical apparatus unless they had a licence. To obtain a licence one had to have served an apprenticeship and be currently working in an approved firm in the electrical industry. This meant that radio traders, technicians and servicemen who were self taught and/or worked for non-approved firms could not install wireless sets etc, and amateur experimenters were to be prevented from modifying or working on their own apparatus. Secondly, the committee of the WIA NSW Division started moves to make the WIA a professionals-only organisation. An editorial in the January '32 issue of the WIA magazine sums up the tone of the WIA committee:

"At the moment, the majority of the members throughout Australia are experimenters and amateur transmitters. In fact, the latter are possibly the greater in number . . . it may be claimed that they indulge generally in transmitting activities and do very little in scientific development of the art or carry out organised work in accordance with the conditions of their licence . . . Therefore, why should the Institute be in the main a transmitters' body instead of an Institute including all those men professionally and otherwise interested in the technical progress of wireless."

The crunch for amateurs came in February 1932 when the WIA NSW Division was officially renamed the Institute of Radio Engineers and, despite being in the majority, the amateur transmitters of NSW were disenfranchised, their assets taken away and they were offered only a meeting place for "listening to interesting lectures". There were the words of Mr E T Fisk, elected first president of the IRE, in his annual report of the Institute of Radio Engineers for 1932:

"The leaders of the Wireless Institute were interested in the encouraging of a consideration of the wider scope of wireless activities. As a result, the IRE absorbed the Wireless Institute in New South Wales and the first meeting of the combined council was held on 4 May 1932, when it was decided to finalise the transfers of all the applicant members of the Wireless Institute . . . In order to provide a meeting place and to encourage the attendance of people who were not essentially technical trained engineers, but still interested in the technical application of wireless, the council decided to form the Radio Society of Australia, and this will be developed to a greater extent in the early future."

Wow! Little wonder that all those non-professionals who enjoyed amateur radio as a hobby felt they had been sold down the river and treated in a condescending manner. It must be said that a vote of NSW members had been taken in February '32 which was 79 to six in favour of the council recommendations, but subsequent events showed that the amateurs had been apathetic, didn't bother to vote and hadn't understood the implications of the vote anyway. The other states had been expected to be part of the change but decided not to participate. (That was probably very wise!)

The aggrieved amateurs who were no longer acceptable to the "professional" IRE, following its absorption of the WIA, quickly formed the Association of Radio Amateurs (NSW), which established close links with the surviving WIA Divisions in other states and eventually, in 1937, it was able to retrieve the registered name of WIA, NSW Division. Further information of these events from a different viewpoint is presented in *Amateur Radio* January '85, pp 6-9. F Goyen VK2UX became the first president of the ARA, in 1932, with Ray Carter VK2HC and C Bins VK2BJ as vice-presidents. Incidentally, the prohibition of amateur construction did not eventuate despite heavy lobbying by commercial and professional vested interests.

Relations between the WIA in other states and Mingay were distinctly cool (to put it mildly) and there was a problem with his continued publication of the official organ of the WIA. That was neatly solved by Mingay ceasing publication of *Television and Radio Review* with the January 32 issue, Vol 1 No 9. It had been the official WIA journal for only two issues!

In February '32 an announcement appeared in the magazine *Radio Monthly* as follows:

> "As from this month (February), *Radio Monthly* will become the official organ of the Wireless Institute of Australia.
>
> "The previous official organ, *Television and Radio Review,* is ceasing publication forthwith and very satisfactory arrangements were made with *Radio Monthly* to carry on on the same basis as *T & R Review.*
>
> "Television information will also be published in *Radio Monthly.*
>
> "Subscribers to *T & R Review* will receive their regular monthly copy of *Radio Monthly.*
>
> (Signed) O F Mingay
> Managing Editor
> *Television & Radio Review* 9/2/32

And what must Leo Feenaghty have thought of all this? After nurturing QTC for four years, graciously giving it up for the good of the amateur fraternity, then seeing the whole lot sink within three months!

In January '33, Mingay started a new magazine called (would you believe *The Radio Review of Australia,* the contents and style of which set the pattern for the later Proceedings of the IRE. Mingay went on to publish a number of other wireless and electrical related journals.

Radio Monthly, the magazine that had suddenly become the WIA official journal, began in Sydney in December 1931, with A W Watt 2WW (of *Wireless Weekly* fame) as its managing editor, and Don Knock as the technical editor. At a price of 1/-, it comprised 68 pages of technical articles for domestic wireless builders and amateur builders, and included columns for the Association of Radio Amateurs of NSW and the WIA. It was a substantial production with glossy paper, of about A4 page size.

It was initially published by Federal Publications, Sydney, which later changed its name to *Federal Journals.* The magazine was the typical mixture of technical articles for builders and listeners, with amateur columns provided by various correspondents.

As outlined above, from February 1932 *Radio Monthly* became the official organ of the Wireless Institute of Australia, following the demise of *Television and Radio Review.* In mid-1932, Don Knock resigned as Technical Editor to join a rival magazine, *Australian Radio News* and Mr A Alexander, a professional radio engineer, became the Technical Editor in September 1932. *(to be continued)*

The Blackwood Radio Club

Early history of the first radio club to be established in South Australia

BY LLOYD BUTLER VK5BR
(ON BEHALF OF THE ADELAIDE HILLS AMATEUR RADIO SOCIETY)

Introduction

THE PERIOD AROUND 1920 to 1930 was an exciting time in the development of wireless communications and radio broadcasting and many keen people were attracted to experimentation with wireless or radio equipment. During this period, numerous radio clubs were formed in the Adelaide metropolitan area and in the country areas of South Australia. It is believed that some 20 or more clubs were formed. The Blackwood Radio Club had the honour of being the first of these clubs to be formed early in 1923. The club remained active to around 1937.

This article outline some of the history of the Blackwood Radio Club. This history has been assembled from various sources such as the club station logbooks, and the good memory of a remaining foundation member, Gordon Ragless. In 1983, a club was re-formed with its base at Blackwood, and in the final paragraphs we will also discuss that club.

Formation

The Blackwood Radio Club was formed by Owen Griffiths, Gordon Ragless VK5GR and Robert Ragless, with its headquarters at the Griffiths home at Young Street, Blackwood. The club affiliated with the WIA in November 1924 and, during the period of its existence, a number of its executive members served on the SA Division council of the WIA. (In fact, member Don Elliott served as a Divisional President).

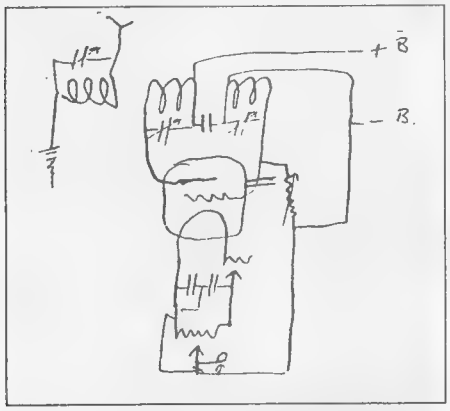

Figure 1 First short wave transmitter – as recorded in the VK5BR log by Don Elliott VK5RD (reproduced exactly as drawn)

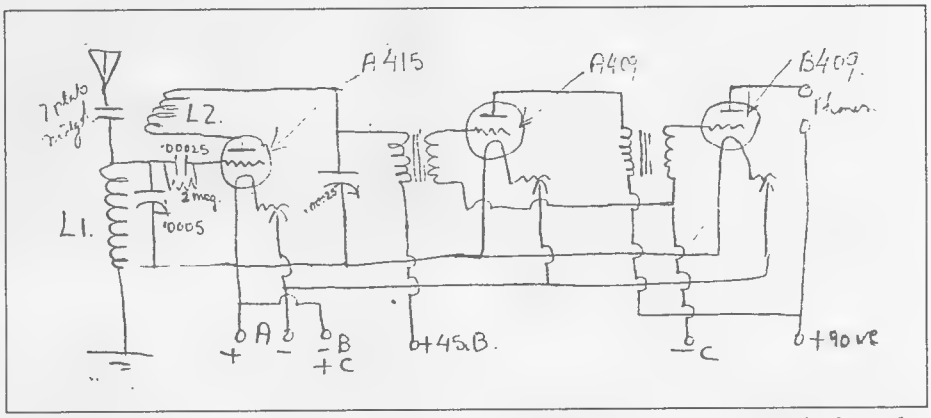

Figure 2 The Schnell receiver circuit used by VK5BR as recorded in the Blackwood Radio Club files. (reproduced exactly as drawn)

Owen Griffith was the first secretary of the club and we was succeeded by Jack Ferry and then Ford Wells. Presidents included L H Griffiths (Owen's father) and Bert Lampe. Some of the other members were Robert Ragless, Don Elliott VK5RD, Arthur Baust, Harry Wheeler VK5HW, Lionel Badenoch VK5LB, Keith Mutton VK5ZY, Jack Hume, Erne Hume, Percy Deer VK5DR and Ivan Banyer (who had the very early callsign of XVQ, dated back to around 1913). Other names will appear as the article progresses.

The club was granted a transmitting licence and first went to air in August 1926. Transmissions were on the 200m band and the original callsign was A5BR. The callsign became OA5BR in 1927 and VK5BR in 1929. The significance of those early callsign prefixes is that "A" stood for Asia, and "OA" for Oceania Australia.

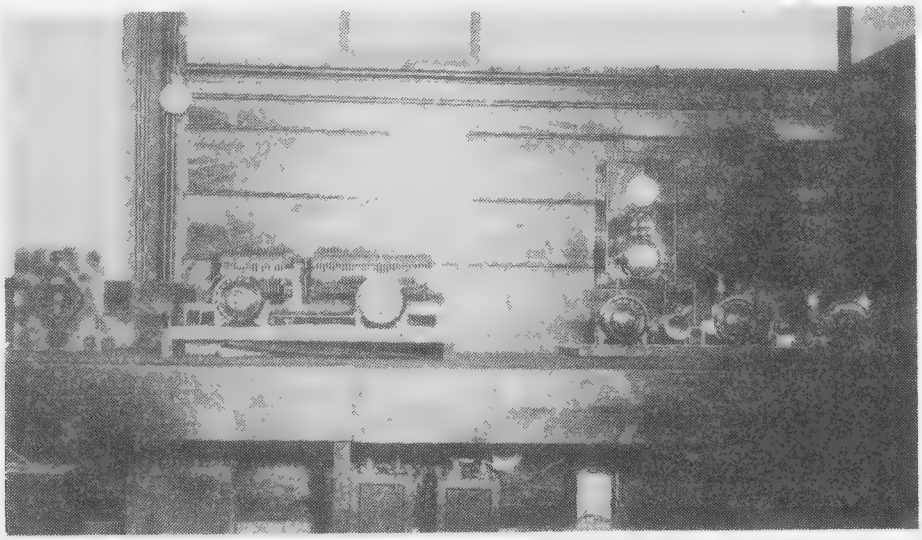

Figure 3 Early transmitting equipment – thought to be VK5BR when operating from Claphamaround 1931

Figure 4 A sketch of the Blackwood Radio Club Orchestra prepared by Max Ragless around 1927. Standing is Bob Ragless playing the clarinet. Sitting is Jack Ferry playing the saxophone and Oswald Ragless the banjo. Frank Hill is shown announcing or perhaps singing. In later years, Max Ragless became a well known artist.

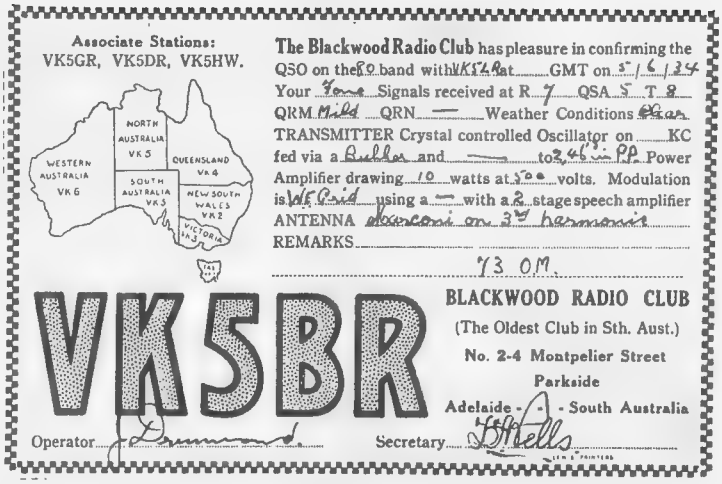
Associate Stations:
VK5GR, VK5DR, VK5HW.
NORTH AUSTRALIA VK5
QUEENSLAND VK4
WESTERN AUSTRALIA VK6
SOUTH AUSTRALIA VK5
NEW SOUTH WALES VK2
VICTORIA VK3
The Blackwood Radio Club has pleasure in confirming the QSO on the 80 band with VK5AR at GMT on 5/6/34
Your Tone Signals received at R 7 QSA S T 8
QRM Mild QRN — Weather Conditions Clear.
TRANSMITTER Crystal controlled Oscillator on KC
fed via a Rubber and to 246 in PP Power
Amplifier drawing 10 watts at 500 volts. Modulation
is Wk Grid using a — with a 2 stage speech amplifier
ANTENNA Marconi on 3rd harmonic
REMARKS
73 OM.
VK5BR
BLACKWOOD RADIO CLUB
(The Oldest Club in Sth. Aust.)
No. 2-4 Montpelier Street
Parkside
Adelaide - - South Australia
Operator
Secretary

Figure 5 QSL card from VK5BR in 1934 when operating from Parkside. The operator is Jim Drummond.

The VK eventually became the internationally agreed prefix for Australia. Station VK5BR operated on the 200m band until October 1932 using the station for both communication with other experimental stations and for experimental broadcasting. The logbooks show that wavelengths between 170 and 200 metres were used. The experimental transmissions were restricted to times when the A and B class stations were closed down, essentially on Sunday mornings and after 10pm in the evening.

Transmissions first commenced from the Young St headquarters with a transmitter that used a split series Hartley oscillator with Telefunken system of modulation. Input power to the transmitter was only 3W, but good reports were received as far afield as Moonta and Kadina. Recorded music was played from a phonograph acoustically coupled into the microphone. Some years later this was replaced by a Bosch electromagnetic pickup.

The transmitter was soon upgraded to a Colpitts master oscillator using a UX201A valve driving a UX210 valve as an amplifier. This was Heising modulated with a Philips A630 valve (later changed to a B605 valve). Input power to the amplifier was 8W.

Construction of the original club station transmitter and receiver was essentially carried out by Owen Griffiths. Later construction was carried out by Jack Ferry.

A shortwave transmitter was first made up in 1928 by Don Elliott VK5RD. This used a split series Hartley circuit with 250V on a UX210 valve running 40mA to provide 10W of input power. A rough sketch of the circuit was made by Don in the VK5BR log and a copy of this is shown in figure 1. The shortwave receiver was constructed from the popular Schnell circuit consisting of a regenerative detector and two stages of audio. The circuit diagram for this was found in a section of the Blackwood Radio Club correspondence and the diagram is reproduced in figure 2.The antenna used with the original shortwave equipment was Zepp fed.

Figure 3 is a photograph of what is thought to be the VK5BR transmitting equipment at Clapham around 1931. On the left, with the large coils, is the 200m MOPA transmitter. The right-hand unit appears to be the HF transmitter.

Operations

The first shortwave contacts were made by Don Elliott in January 1928 on 32m and using the CW mode. Communication was set up for every Friday evening between 7pm and 11pm. Contacts were made with interstate and overseas stations.

Between October 1932 and January 1934 there appears to have been a break in the operations of VK5BR. Transmissions recommenced in January 1934 on the 80m band using the precise frequency of 3.593kHz. This continued until April 1935.

At some stage, the club must have further upgraded its transmitter to around 30W input. The log records figures of 600V at 50mA as early as April 1930. The precise frequency of 3.593kHz also indicates that they had probably changed to crystal control.

The club station shifted its location a number of times. It was first located at Young St, Blackwood, and then at Waite St, Blackwood, both the Griffiths residences. Around 1930, it was relocated to the home of Jack Ferry in Clapham and, around 1934, to the home of the Hume family at Parkside. This was also the original location of Broadcast Station 5DN, established by the Hume family. After 1935, the equipment was not operated, and some of it was stored at the home of Gordon Ragless. What fate it ultimately met is not clear.

During the period 1926-1929, frequent operators of the club station were Owen Griffiths, Gordon Ragless, Ford Wells, Robert Ragless and Don Elliott. Frequent announcers when the station broadcast were Owen Griffiths, Jack Ferry, Harry Wheeler, Oswald Ragless, Frank Hill, Robert Ragless, Ford Wells, Douglas Wright, John Messer, Milton Trott, Sid Maag, S Macey and H Naughton. The club also introduced its own studio orchestra. A humorous sketch of this orchestra in performance was prepared by Max Ragless around 1927. The original sketch is kept by Gordon Ragless and a copy of this is shown in figure 4. Here is shown Bob Ragless, Oswald Ragless and Jack Ferry playing the instruments, with Frank Hill announcing.

During the early years, contacts were made with many other stations, but not all of these were licensed. Many came under the category of what was known as an IWW, which stood for "Illicit Wireless Worker" or, in the words of Gordon Ragless, "I Wonder Who". They are more commonly known today as pirates.

In the period 1930-1932, station operators were Jack Ferry, Ford Wells,

Figure 6 Combined field day of Blackwood Radio Club, Northern Districts Radio Club & Eastern Districts Radio Club held one Saturday near Eden Hills Railway Station. Top row from left – John Gill (BRC), Alec Robertson, Keith Mutton VK5ZY (BRC), a NDRC member, Doug Merry (NDRC), a NDRC member. Bottom row from left – Bob Ragless (BRC), Keith Litchfield (EDRC), Owen Griffiths (BRC), Bill Harmer (EDRC), Dick Whitington (NDRC), Clive George (EDRC).

Lionel Badenoch, Frank Hill, Jim Drummond, Ron Wauchope, Erne Hume and Milton Trott. From 1934 at the Parkside location, operators were Ford Wells, Frank Hill, Erne Hume, Jack Hume and Jim Drummond. Figure 5 shows a QSL card from VK5BR for a contact in this period on 80m. This demonstrates that, at that time, the RF power amplifier was push/pull 46 tubes with 500V on their plates running an input power of 10W. Grid modulation was used and the antenna is some form of Marconi.

It is interesting to observe how so many amateur radio experimenters turned to radio as a career and often the reverse. Some of the operators of the club station sought a career in radio broadcasting. Erne Hume was chief engineer at station 5DN from 1925 to 1941. He designed much of the transmitting and studio equipment used at that station, and designed the original transmitter at 5RM Renmark. Jack Hume was an announcer at 5DN for some years and was involved in other broadcasting activities such as writing plays. Frank Hill and Ford Wells became members of the technical staff at 5DN and 5RM.

Other Activities

For about four years around 1931 to 1935, the club published an official organ called "KEY-KLIX", and this was edited by Ford Wells. A typical issue for February 1932 included an editorial, a technical article on television by Harry Wheeler VK5HW, shortwave notes by Gordon Ragless VK5GR and other features.

As with our clubs of today, the Blackwood Radio Club arranged for interesting technical lectures at its meetings and arranged for visits to such places as Radio Station 5DN, the Unley Telephone Exchange, the Adelaide Observatory and the Hackney Tram Depot. It also organised social events such as the Blackwood Radio Club picnic and other field days. One of the field days included a visit to Kangaroo Island via the old *SS 'Karatta'* to visit a radio amateur on the island. According to Milton Trott, this turned out to be rather a rough voyage. Another activity was the provision of radio for the Adelaide rowing event, Henley on Torrens.

Keith Mutton VK5ZY was able to supply a group photograph taken by Gordon Ragless at an early field day around 1923. (Refer figure 6). A copy, probably supplied by Gordon, was also found in the Mitcham Library archives. The field day was a combined event of the Blackwood Radio Club, the Northern Districts Radio Club and the Eastern Districts Radio Club. In the centre of the photograph is a transmitter which used a single early Mullard ORA valve. (ORA stood for Oscillator Rectifier Amplifier). Individuals in the group, with headphones fitted, had simple receivers which were used to detect signals from the transmitter. The object of the field day exercise was to see how far away they could go and still pick up the signals.

For many years, the Blackwood Radio Club ran a monthly dance which was held at the Eden Hills Parish Hall. It also held an annual radio concert at the Boys Club Hall in Blackwood. From all accounts, the Blackwood Radio Club became quite a social organisation, with social and not just technical type of membership.

The club ceased to be active around 1937, a little before the start of World War II. The club was not reactivated

Figure 7 Gordon Ragless operating his station VK5GR around 1933.

after the war and its callsign VK5BR was allowed to lapse. The callsign was re-allocated to Lloyd Butler in January 1946 and still remains in his hands.

VK5GR

We have been fortunate to have club foundation member Gordon Ragless still with us to verify some of the facts presented in the article. Gordon operated his own station VK5GR and a photo of Gordon and his early amateur radio equipment is shown (refer figure 7). A further recent photograph (figure 8) shows Gordon with his early transmitter and the original VK5BR microphone. Gordon's transmitter is now an exhibit at the Adelaide Telecommunications Museum. The VK5BR microphone case is held by the Adelaide Hills Amateur Radio Society.

With 67 years elapsed since the Blackwood Radio Club was formed, and 54 years since it ceased to function, it is not surprising that there are now few of its members to be found. However, in addition to Gordon, we were able to contact Keith Mutton VK5ZY, Jim Drummond and Milton Trott, who were also members in the very early years of the club, and who were able to add a few details for this article.

Figure 8 A recent photograph of Gordon Ragless with his own early transmitter and the old VK5BR microphone.

A New club

In recent years, radio clubs have again become popular and numerous clubs have been formed much as they were in the 1920-1930 era. In 1983, some 46 years since the early Blackwood club had dissolved, a new club was formed with its base at Blackwood.On 10 February 1983 the Adelaide Hills Amateur Radio Society was formed in the Blackwood War Memorial Hall. Marshall Emm VK5FN was elected president and, at a following meeting on 17 March, David Green was elected secretary and Alf May was elected treasurer.

The society was accepted for affiliation with the WIA on 26 July 1983. An amateur station licence was taken out with the callsign VK5BAR (since the old VK5BR call had been re-allocated). The society started with a membership of 14. At the time of writing, this had increased to a figure of 65.

The society has regular monthly meetings at which there is usually a technical lecture or guest speaker. Visits have been arranged to such places as the National TV transmitter site at Mt Lofty and the Telecom Cellular Radio Base. A popular event with South Australian amateurs is the annual November buy-and-sell day which is organised by the society.

Amateur radio station equipment is owned by the society and it involves its members in radio field days and public radio exhibitions. It is also responsible for hosting the yearly national CW sprint.

Essentially, due to the initial efforts of member Marshall Emm, the society has set up facilities to examine amateur operator certificate candidates in devolvement of this function by the DoTC. In fact, the society was the first to conduct examinations in Australia. These first took place on 25 November 1989 and have since been repeated at regular intervals.

Various enthusiastic members have held office in the society since its inception. At the time of writing, the president was Alan Haines VK5ZD, the secretary was Meg Box VK5AOV and the treasurer was Bryan Trott VK5PBT. Others who have held office include Marshall Emm VK5FN, Bob Burton VK5ZAL, Hans Smit VK5YX, Doug Head VK5DUG, Gordon Welsh VK5KGS and Jenny Warrington VK5AMW.

Writer's footnote:

It is pure coincidence that I was issued with the callsign VK5BR in 1946, and at that time I had no idea that the callsign had such an historic background. However, this gave me an incentive to find out more about its early history. What you have read now records in print the information, such as in the memory of Gordon Ragless, before it is lost.

Lloyd Butler VK5BR **ar**

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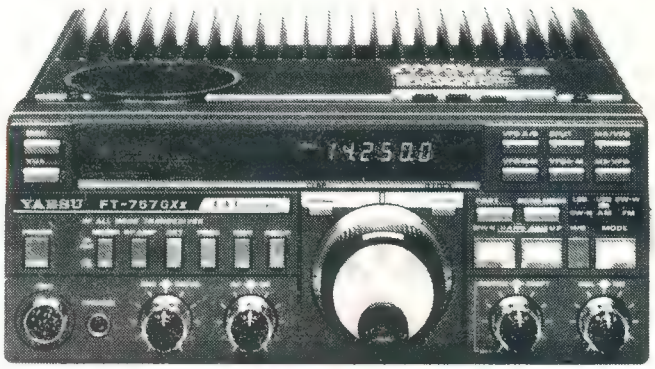

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(Written from a delegate's viewpoint, this account complements that by 9V1RH. Ed)

ON A PREVIOUS OCCASION (*AR* September 1990) I wrote about SEAnet 1989. I said at the time that whoever organised the next convention would have a very difficult act to follow. Nothing daunted, Malaysian Amateur Radio Transmitting Society (MARTS) undertook to hold the 18th Seanet Convention, possibly in Malacca. As it turned out, the venue was changed to Kuching, and its member club, Sarawak Amateur Radio League (SARL) became the host. At the last count, SARL had 24 licensees, of which 17 are in Kuching, and 10 members without licences (but high hopes). Due to their enthusiasm and drive they outdid last year's efforts, something I thought impossible. Let me now tell you something about SEAnet for 1990.

After 11 hours travelling, our little party comprising Alf VK3LC and XYL, plus myself and XYL, landed at Kuching airport a few minutes before midnight local time. A friendly greeting, bang, bang, bang with a rubber stamp and a "have a pleasant stay" from the immigration officer saw us officially in Malaysia. On leaving the building we were confronted by a huge banner which read:

1990 SEANET DELEGATES
WELCOME TO SARAWAK
LAND OF THE HORNBILLS

under which was what I thought would have to be the happiest looking face on earth, but I found after a few hours that such faces were pretty much the norm in that part of the world.

The face which greeted us was that of Festus 9M8FH who whisked us off to our hotel and made sure we were comfortably installed. As far as I could gather he kept meeting planes for the next 36 hours, with hardly a break.

We had arranged our trip to arrive two days before and to depart three days after the convention, giving us a change to see something of the area. I'll come back to this later.

The organising committee worked like beavers all Thursday and Friday on the registrations, preparation of name tags and putting together folders of information regarding the program for the weekend, and what could be seen and done after the Convention.

These folders, along with an attractive ceramic memento of the occasion and a most informative 1990 diary, were left in our room some time Friday when we were out exploring the city.

Proceedings began with a dinner on Friday night hosted by the Mayor of the City of Kuching South. The convention was opened officially by the Chief Minister of Sarawak on Saturday morning, followed by lunch which was hosted by the State Government of Sarawak. Saturday afternoon was devoted to the symposium, when we heard from the Director-General of Telecommunications Malaysia, a representative of the President of JARL, who was unable to attend personally, Mr D Devan, Director of IARU Region III, Mr Geoff Robinson of IPS Radio and Space Services Australia, who gave a demonstration of IPS Advanced Stand Alone Prediction System, and David Rankin, chairman of IARU Region III. Dinner on Saturday night was hosted by the Ministry of Environment and Tourism Sarawak. The night was topped off with a durian party by the pool.

Sunday's daylight hours were devoted to sightseeing, taking in a tour of the city, a river cruise (lunch served on board) and a visit to the cultural village located about 30km from Kuching.

The final official event was more feasting on Sunday night, this time hosted by the Director General, Tourist Development Corporation of Malaysia. This event, and the festivities associated therewith, lasted until midnight.

It would be impossible for me to list all the speakers at the various functions, but I must mention Mr Richard L Baldwin, President IARU, who managed to celebrate the 25th (approximately) anniversary of his 39th birthday during the weekend.

All told, 258 people representing 18 countries attended the convention. Apart from the countries in the South East Asia area, other countries represented were Italy, Germany, England, Canada, USA, India and Sri Lanka.

An amateur station with the special callsign 9M8SEA was set up on the 10th floor of the Holiday Inn. This created much interest for the VIPs.

Apart from those already mentioned as helping with the convention, many business organisations helped with advertising in the diaries, and Malaysia Airlines sponsored SARL's paperwork.

To sum up the Convention I can do no better than quote verbatim from Dick Baldwin's final address:

"I get a chance to travel all over the world, meet hams all over the world, meet telecommunications administrators all over the world, attend hamfests and Conventions all over the world; I have never been to one that was better organised than this (loud applause). It has been a great weekend."

A large proportion of the weekend was video taped, and for a very modest sum I obtained edited copies of the three tapes — a unique memento of the Convention.

On the Monday after the Convention, at some unreasonable hour of the morning, some of the younger and physically fit delegates (that lets me out) left on the DXpedition to Mulu Caves where they operated as 9M8ULU. They had not returned by the time we left Kuching, but we were told they had managed to make a number f contacts.

The SARL club station 9M8MKS is permanently located on the 11th floor of the Holiday Inn, with the antenna systems on the roof. Now that is what I call organisation. I had a look through their log book, and from 19/2/90 to 12/11/90 they had made 1870 contacts, only one of which was with a VK. Alf and I improved on this a little by working two VK5s on 10m. Although we were hearing VKs on 15m, we could not raise anybody.

We still had a few days to fill in and managed a day trip to Bako National Park — a full day trip involving travel by car and longboat. Unfortunately, we could not cover the whole park as the going was too rugged for us senior citizens. I would suggest to anybody contemplating a trip to Sarawak, that you contact the Treasurer of SARL — Jimmy Choo Poh Hin — who is probably in the best position to suggest trips etc to match your age and physical condition.

Having our XYLs with us meant — of course — a shopping expedition. Shopping in Kuching bears no resemblance to

shopping in Singapore. Their newest (five years old) and largest shopping complex has about 50 shops spread over four floors. In the main their shops consist of the so-called shop houses. Life moves at a leisurely pace, nobody pesters you to make a purchase, and prices are very reasonable. If you stop to look at a shop the proprietor will most likely come out and invite you in.

Walk in on your own to browse and receive a friendly "selamat datang" (welcome). Decide to make a purchase and the proprietor and his family all come along to assist you. I especially recall my XYL deciding to buy a couple of silk scarves. Making her requirements known, almost instantaneously four people were producing scarves of all colours, patterns and sizes, chatting and laughing all through the transaction.

No ham gear is available in Sarawak.

Strangers would stop us in the street to greet us, ask where we came from, how long we were staying, did we need any assistance. On being assured we had everything under control, we would exchange a few pleasantries and they would wish us a happy visit and be off.

Visit Malaysia Year and Selamat Datang were really working.

On reflection, if I had to nominate the happiest person I met, I would have to name Francis, the immaculately dressed restaurant manager at the hotel. He could make a delightful meal into a most pleasurable experience just by greeting us with his infectious smile and stopping to talk with us as he moved round the restaurant. He and his staff treated our smallest request as if it were a Royal command. In discussion with him we learned that he worked from 7am until 9pm six days a week. For this work he received 15 ringgit (less than $7.50) and one meal a day. The hotel supplied his suit.

We seemed to spend an enormous amount of time eating, and, as I said last year, it seems to be a national pastime. If ever eating is made an event at the Olympic Games, Singapore may take the gold, but the silver and bronze will go to Malaysia.

After a most pleasant week we departed for a few days in Singapore, where, armed with a list of establishments where one might purchase amateur gear, Alf and I set out on an expedition. Much to our surprise, there was very little available, and what was there was about the same price as we would pay here; more if one had to pay duty and sales tax on arrival home. We made no purchases. It looks as though today's economic climate is fast catching up with Singapore. The only bargains appear to be some items of video equipment, of which there appears to be a vast amount available.

SEAnet 1991 — well, it is scheduled for Thailand, but not in Bangkok. The most likely venue is Chiang Mai, and unfortunately there is virtually no chance that we will be attending as we have other commitments for 1991. Hopefully somebody will attend to represent Australia. **ar**

Fast CW Reminiscences

JACK WHITTAKER VK4CGO
11 CARNEGIE ST
WESTLAKE 4074

MUCH HAS BEEN WRITTEN recently about changing times, the changes in amateur radio procedures and attitudes and the value in home brewing, the Morse code etc, etc.

I believe that we are now witnessing a changing pattern in the CW part of the bands — as my observation seems to indicate the apparent disappearance of the fast CW ragchewers.

I remember spending many hours in earlier years listening to operators such as George Studd ZL2AFZ — who was without any doubt the fastest CW operator in this part of the world, even though he was, I think, a great-grandfather and getting well on in years, his CW prowess was still quite amazing — 20m QSOs with (as I recall) W9ELG were a source of very high-speed code listening on that band — something which seems noticeably missing from the airwaves today.

Sadly many detractors and knockers of CW I think simply cannot appreciate just what that fast code was about, and nowadays the younger operators do not progress to those levels — I suppose the backgrounds and the interest and incentives do not any longer exist. Perhaps it is akin to lamenting the passing of the steam train, but a backward glance could be worthwhile, if only to realise what has all but slipped away already.

Fast code at the speed level I am referring to was really something, which, apart from sheer practice and achievement, was a situation where the operator actually thought words and word groups — in fact just THOUGHT what was to be said as in normal everyday speech. Morse was sent and received on THAT level. All the intermediate brain processing and finger co-ordination were at a subconscious and automatic level, and whilst I concede that not everyone may be capable of such skill levels, it does make CW at such levels intriguing, to say the least.

I had the pleasure of meeting George Studd in the late '70s and had quite a chat with him.

George was, I believe, in his earlier years an operator with the Post and Telegraph section of the Post Office and had worked through from hand keys to bugs to electronic keyers — ending with the iambic keyer, which, with squeeze technique for letters C, F, L, Q etc, contributed to smooth speed keying. He did NOT use a keyboard keyer — though possibly W9ELG did, I do not know about his method of operation. George told me that he had not worked with his hands with anything heavier than a pen or pencil, which no doubt assisted him to retain such nimble and responsive fingers. He told me that he had taped a sending session of 10 or 20 minutes, timed it accurately at 62 words per minute, and, upon slowing the tape for replay and careful scrutiny, found one character error and one slur.

Ham radio QSOs — ragchews on CW (without keyboard computers) at high speeds — upper 40s — into the 50s and above DID exist, and were ENJOYED by the participants, but as the years have progressed, most of those who developed highly advanced operating skills have either been slowed by the aging process, retired from these aspects of the hobby, or died of old age.

Though the passing of such advanced skills has undoubtedly occurred, and further lessening of CW values is inevitable, the past high levels of achievement still should be historically recognised — even if what remains in 1991 seems like pure nostalgia.

ur

An Overview of EMI/EMC in Australia

MR N JOSEPH
COMMITTEE EXECUTIVE OFFICER, TE/3
STANDARDS AUSTRALIA
(REPRINTED BY PERMISSION FROM STANDARDS AUSTRALIA)

Australian Standards

AUSTRALIA HAS RECENTLY published a series of electromagnetic interference (EMI) Standards, based on the International IEC/CISPR Standards, in order to set limits of tolerable interference to other equipment, and to assist Australian manufacturers export their products.

Standards now exist covering emission of interference from information technology equipment (ITE), ie computers and like equipment, industrial scientific and medical (ISM) equipment, overhead powerlines and radio and television receivers etc.

All electrical and electronic equipment produces electromagnetic interference, either conducted along the supply cord or radiated directly from the equipment.

Similarly, most equipment is susceptible to interference either conducted into it, usually via the mains supply lead; from nearby radiated electrostatic or electromagnetic fields or from electrostatic discharge from nearby objects.

For equipment to be safe and operated satisfactorily, it must be compatible with other equipment, that is, emit interference below a given level and operate in an environment of up to a given level of interference.

With the proliferation of electronic microprocessor appliance controls and, computerised office and factory equipment, compatibility has become of real concern.

Although Australia has its own EMI Standards which specify acceptable limits, these limits were voluntary until 1985 when a mandatory Standard specifying the limits of interference from industrial, scientific and medical (ISM) equipment became necessary to protect safety-of-life communications, aircraft navigation, from industrial high-powered radio-frequency (RF) heaters.

Because of the spread of computer equipment into telecommunications equipment it has also become necessary to protect the telecommunication network, so that from January 1991 all equipment directly connected to the telecommunication network must meet Australian AS3548 — Electromagnetic interference from information technology equipment (ITE).

Australia has copied the IEC/CISPR Standards except where variations were absolutely necessary, such as in Australia where there are several aircraft navigation beacon frequencies which are not used elsewhere, and these frequencies must be protected (safety-of-life) from high-powered industrial equipment.

Australia has adopted the international EMI Standards prepared and published by CISPR, a group of committees which is part of the International Electrotechnical Commission (IEC) Standards preparation organisation.

International Standards

IEC Standards have been accepted by all the European Commission (EC) and European Free Trade Organisation (EFCO) countries plus Japan, New Zealand and Australia, and although the USA FCC Standards vary, they are somewhat aligned.

The European Commission, by its EMC Directive 89/336/EEC of May 1989, has made EMI/EMC Standards for *all* electrical equipment mandatory from December 1922, the member states having to implement legislation by July 1991 for enforcement by January 1992.

The European Commission compliance is based on self-certification where a manufacturer submits a certificate declaring their equipment meets the appropriate European Standard (EN), which is technically the same as the IEC Standard. Testing does not have to be carried out by an independent third party. The exception to this ruling is for equipment connected to a telecommunication network where mandatory third party testing is required.

New Zealand has made EMI Standards mandatory except for motor ignition noise, the compliance and testing authority being the New Zealand Post office, but they do accept test reports from approved laboratories.

Japan has voluntary (virtually mandatory) Standards based on IEC Standards for most equipment under the control of VCCI accepting reports from approved laboratories.

EMI/EMC
Comparison Australian, European and USA Standards

AS	EN	CISPR	BS	FCC[4] CFR47 Code of Federal Regulations	Short Title	Comments = identical ≠ not identical
1044	55 014[1]	14	800		EMI Appliances	AS=CISPR, =EN, BS
3548	55 022[1]	22	6527[1]	Part 15	EMI Appliances ITE	AS=CISPR, =EN, BS
1052		16	727		Measurements	AS=CISPR, =EN, BS
2257		12	833[3]		Ignition	AS=CISPR
2344		18.2[2]	5049[2]	ANSI 430[5]	Overhead lines	No limits in BS or CISPR
1053		13	905	Part 15	Radio & TV	AS≠CISPR
2064		11		Part 18	ISM	AS≠CISPR
2839		IEC 107	3549[2]		EMC Radio/TV	AS≠CISPR, BS
XXXX	55 020	20			Immunity Radio/TV	AS=CISPR, ≠EN
3145		17[2]	6299[2]		Suppression devices	AS=CISPR, BS
—	60.555.1	IEC 555.1	5406.1		Harmonics-definitions	EN=BS, IEC
2279.1	60 555.2[1]	IEC 555.2	5406.2[1]		Harmonics-household	AS=IEC, ≠EN, BS
2279.2	—	—	—		Harmonics-industrial	
2279.3	60 555.3[1]	IEC 555.3	5406.3[1]		Volt fluctuation-household	AS=IEC, EN, BS
2279.4	—	—	—		Volt fluctuation-industrial	
NIL	55 015	15	5394		EMI fluoro	BS=EN, ≠CISPR
				Part 68	Telecom connected	

Notes: 1 EN=BS
2 CISPR=BS
3 =NZS 6621
4 FCC differ from all others, ie in limits and in bands
5 ≠EN, CISPR, BS

(We are also holding a copy of "The International Electromagnetic Compatibility (EMC) Standard for Information Technology Equipment (ITE) — Future Revisions of IEC/CISPR publication 22 (AS3548)" by I McFarlane, Head, Electromagnetic Compatibility Group, Research Laboratories, Telecom Australia — Ed)

continued on page 34

Build an Insulation Tester

BY MERVYN EUNSON VK4SO
GPO BOX 1513 BRISBANE4001

AN INSULATION TESTER IS NOT the sort of thing electronics stores stock, and our amateur fraternity seems to have overlooked the uses of this instrument.

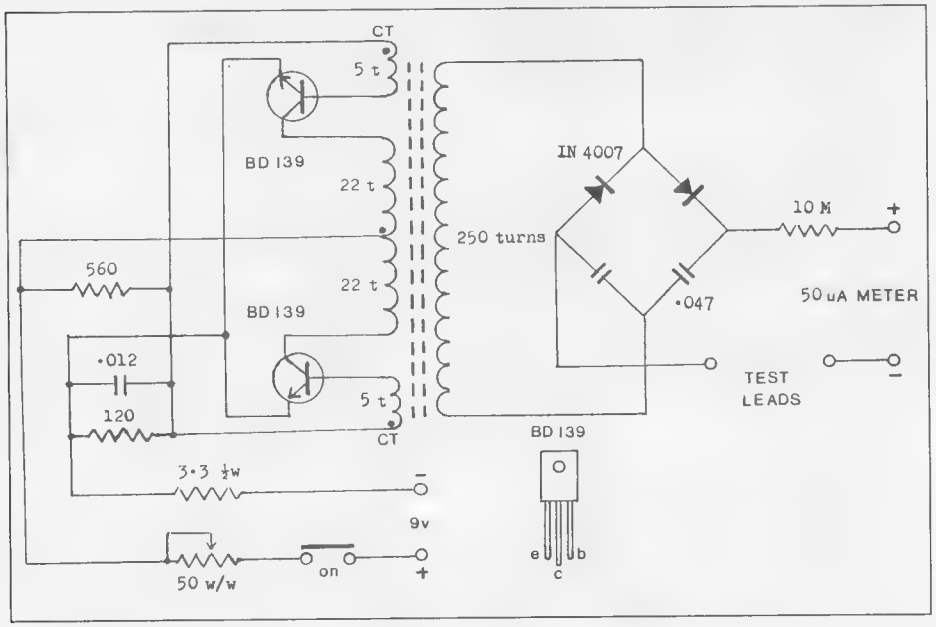
It's handy for testing isolation of salvaged transformers selected for rewinding, possibly charred by overload to the point of breakdown. It has many uses in checking antenna transmission lines and all manner of wiring or cables. Indeed, it will measure anything in the high megohm range — for example, have you ever tried to measure a 10M resistor on a multimeter?

The concept seemed simple enough, only a high-impedance ohm-meter with a range in the hundreds and thousands of megohms. A high driving voltage is needed, of course, with low current for safety.

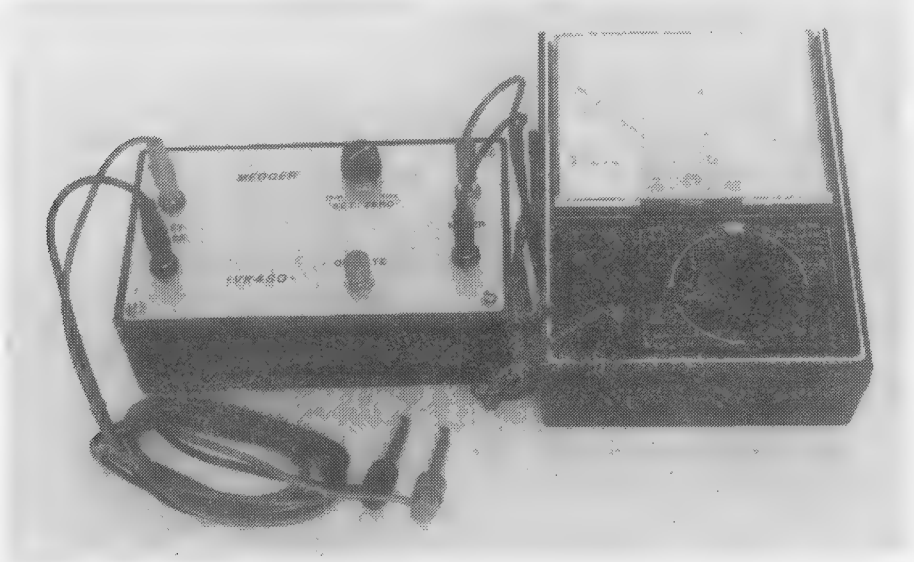
It took no time to knock up a working model. A search of the junk produced a telephone-ringing alternator delivering 48VAC, plus a small 12/12V mains transformer with primary taps of 230/250V. With a rectifier diode and meter a fair insulation tester resulted, leaving no incentive to improve on it. However, it was not quite state-of-the-art, for things just have to be solid-state these days.

So, back to the junk box for a pot core to wind a DC/DC inverter. No joy, and they're too dear to buy. Hmmm, but there's one of those funny ferrite formers from a TV timebase — it'll do. Now to salvage wire for a secondary winding. This proved to be a bobbin from old PMG gear, nicely labelled 500 turns 8mil (or 32g). Even better, the inside was the same diameter as that of the former, for a neat fit (Murphy's me mate, you know). This enabled a quick lash-up to test feasibility of the approach. Sure enough, better than 500V AC output was available.

Not being one to rely on supernatural help, a simpler secondary was homebrewed. An offcut of half-inch PVC con-



The Simple Circuit



The bench-top assembly

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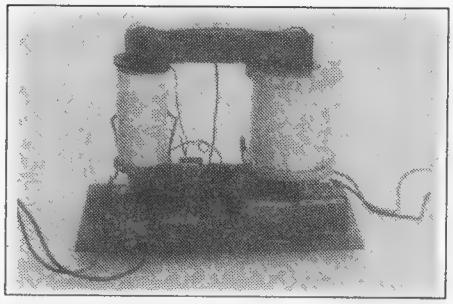
duit with two plastic cheeks added made a bobbin to fit on one leg of the square former. The salvaged 32g wire (equivalent to decimal size 0.2mm) neatly wound 100 turns per layer. A total 250 turns were wound in layers, each interleaved with waxed paper (lunch-wrap). The intention was to produce 250V AC and use a voltage-doubler rectifier to give 500V DC into a 50μA meter (if you plan on using a 100μA meter, a total 500 secondary turns will be required). Any gauge of wire will do, but finer wire than 32g breaks too easily, and thicker gauges prove too bulky.

The primary winding was fluked equally easily. A layer of tape was placed on the other leg of the former with fibre washers for cheeks. Two short pieces of 22g wire somewhat over a metre long were scrounged for starters, and the available space was simply filled with one layer of 22 bifilar turns. This proved to be another hole-in-one (thanks again, Murphy).

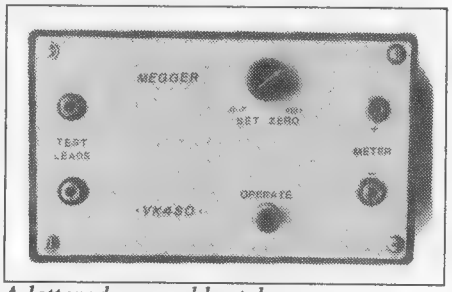
The feedback winding goes over the primary. A single centre-tap winding might suffice, but a balanced bifilar form is more efficient. Thus five bifilar turns of something like 26g are needed (thin hook-up cable is acceptable).

The base connections or ends of this feedback winding need to be phased correctly. A tedious explanation is avoided by suggesting that if the inverter fails to work the first time, merely reverse the feedback leads.

Two small BD-139 power transistors conduct alternately to deliver ample drive. No heat-sink is necessary, for total dissipation is but a fraction of their limit of eight watts. Base current is limited by a 560 ohm resistor and another of 120 ohms creates imbalance in the symmetrical circuit to cause oscillation to be self-starting. A surge-limiting resistor is included in the emitter supply, and the few components mount conveniently on



The simple assembly



A lettered case adds style

plated strip-line board.

The creature is not fussy about supply voltage, and will function happily with 6V applied. This allows a small inbuilt 9V battery to be used (current drawn is about 75mA and operation is brief and infrequent). A press-button switch in the supply lead energises the circuit. To obtain the precise output voltage of 500V for FSD a 50ohm wire-wound pot is added as a zero-set control.

Two 1000V diodes (IN4007) serve in a voltage doubler rectifier. With a high frequency of operation and negligible load only minimal values are needed in the discharge capacitors, so two .047μF polyesters (630V rating) are adequate. Now there is the required DC output of 500V

A one per cent series multiplier of 10M determines this same centre-scale reading on a 50μA movement. Such a meter would need to be calibrated and marked, of course, a simple matter using Ohm's Law, to produce the familiar logarithmic scale, cramped at the upper end.

At this stage a potential setback loomed — no suitable meter in the junk box! But, hold on, is there not one on the bench with a 50μA range on the trusty multimeter?So help me if it isn't already calibrated with a direct-reading ohms range showing (with mental conversion) exactly 10M at centre-scale and a top reading of 2000M (you beauty, Murphy!). Easy enough to couple it outboard to the Megger with banana plugs.

Operation is exactly as with a multimeter. First short the clips, used for connection to whatever is to be tested, and obtain FSD on the 50μA range with zero-set control. Now measure the unknown quantity, anything up to 2000M. Actually, in most cases you'd be gauging the extent of isolation, usually a degree of good or bad, and precise values seldom are needed.

The output voltage is safe to handle— an inadvertent encounter merely produces a slight tingle, barely perceptible with the high impedance. *(Still not a recommended practice. Ed).*

Besides testing doubtful transformers, the instrument proves excellent for checking twisted mic cords and suchlike. Suspect leaky coax also, even open antenna feeders (dust on the spreaders creates havoc). In one specialised instance it was invaluable in determining the quality of various insulating materials for constructing Tesla coils and high-voltage apparatus (possibly a forthcoming article).

The insulation tester or "Megger" is better known for its use by electricians, who perform mysterious rites on mains cables and earth wiring. However, such things are not within the province of amateurs, and this branch of fiddling is best left to those trained and licensed for the purpose.

Note "Megger" is a trade name. **ar**

An Overview of EMI/EMC in Australia *(continued from page 32)*

In the USA, electromagnetic interference is controlled by the Federal Communications Commission (FCC) under its Code of Federal Regulations CFR47, Part 15, Subpart J. They have six levels of authorisation:

Type approval — mandatory, safety-of-life equipment

Type acceptance — licensed transmitting equipment

Certification — non-licensed devices, ISM

Notification — manufacturer tests and keeps record of text

Verification — computers (except PC), TV and FM — manufacturer tests and keeps records

Registration — telecommunication connected equipment

Most approval is by desk review with appropriate test certificates. FCC bands and limits differ from the IEC, usually being a looser limit. There are no EMC limits in the USA.

EMC

Very few EMC Standards have been published giving the interference levels of the environment in which equipment must satisfactorily operate. In Australia there is AS2839 —

Colour Television Receivers and AS2279, Parts 1, 2, 3 and 4 —

Disturbances in mains supply networks, but because of the EC directive, considerable development of EMC Standards has been undertaken by IEC Committees. Several of these compatibility drafts are near to completion and will probably be published within 12 months. These IEC drafts will be copied by Australia as soon as they are published, thus giving Australian international EMC Standards.

Summary

Australia has aligned itself with International Standards so that testing to Australian Standards will meet the requirements of EN, IEC or FCC Standards.

Australia's EDI/EMC regulator, the Department of Transport and Communications, is at present examining the need for mandatory electromagnetic interference standards and, if found necessary, it will examine the economic effects before introduction. **ar**

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AMATEUR TV STARS IN HISTORIC TEST

Tom King, VK2ATJ writes about the historic 'first ever' national satellite ATV broadcast late last year, which came about as a joint effort by the Gladesville Amateur Radio Club, the WIA and AUSSAT. He tells how it came about, how it was done, how the broadcast went and who sent in reception reports.

'SPREAD SPECTRUM' CELLULAR PHONES

A small firm in San Diego, California has developed a technology which allows many more cellular radio phones to be squeezed into the available spectrum. Based on the 'frequency hopping' and 'spread spectrum' techniques used by the military for secure communications, the new CDMA system has significant advantages over existing TDMA and FDMA systems. Stewart Fist explains...

NEW 2M FM TRANSCEIVER - 3

In the third article describing this outstanding new design for an easy to build 2m FM transceiver, Jim Rowe, VK2ZLO explains how to build and test the audio, IF and low-power RF sections of the circuit. With these completed and tested, the receiver section becomes operational.

REWINDING OUTPUT TRANSFORMERS

Obtaining replacement output transformers for burnt-out or otherwise faulty audio output transformers in old valve radios or amplifiers is now almost impossible. But rewinding such transformers isn't all that hard, as Peter Lankshear explains. All you need is patience and a few simple hand tools.

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Amplifier Reminiscences

PETER R SPENCER VK5KBK
PO BOX 147 CLARE 5453

HAVING READ AN ARTICLE on the Williamson Amplifier, of 1947 vintage, in the July issue of *Electronics Australia,* I have been prompted to write on some rather humorous experiences I remember around this period. Most of what follows concerns a character I knew who was an avid supporter of triode output stages in audio amplifiers, to the exclusion of all others.

This character, who I shall refer to as "Syd", was not blessed with an outstanding knowledge of the English language, but what he lacked, he more than made up for in stating his views with forcefulness and uncompromising attitude. He was a tireless experimenter and spent a great deal of time and money on his audio amplifiers. In order to convey the full impact of his statements, I will write Syd's version of what he wished to convey, followed by the accepted terminology.

I feel sure many readers who remember the days of valves will find this rather amusing.

Having read all about the virtues of the Williamson amplifier, I happened to meet Sydney shortly after reading the articles and, of course, asked him if he had seen them. Well, Syd informed me that on a visit to Adelaide, he had actually heard an example at a large radio store. When asked his opinion, the reply went something like this: "No good at all — full of 'screechy treble'; not enough bass."

Now we come to the first 'clanger' — "You can't beat TREEODS (triodes) with plenty of BYRUS (bias); them PENTHOIDS (pentodes) will never sound any good."

This rather 'rocked' me and I found it a bit difficult to keep a straight face. However, more was to come. It appeared that Syd had tried a new circuit using his beloved TREEODS and he was far from satisfied with the results. It was, of course, nothing to do with the valves or his circuit, but he was sure the output transformer was causing all the trouble. When I asked him for an explanation, he uttered his masterpiece — I quote — "The output tranny has HYSTERICS (hysteresis) in THE LAMINGTONS (laminations)."

There was no doubt that Syd had been doing some heavy reading on the design and performance of output transformers, but due to a somewhat sketchy education, his understanding of the technical wording was a little off the track.

What made these remarks even funnier was that his statements were always made in very rapid speech and an atmosphere of complete and uncompromising authority.

Following all this, which happened so many years ago, I very recently experienced a strange stroke of fate. My son, who lives in Port Lincoln, rang me to say that he had come across a hefty power supply which apparently, had been bought at an auction sale by a neighbour of his, and he wondered if it would be of any use to me as the neighbour had no use for it, but thought he might just "plug it into the mains — to see what would happen!!"

Eventually I came into possession of this supply and was amazed when I recognised it as the power supply from a huge PA system which Syd had bought from a firm which, I understand, built it for the Adelaide Showgrounds. The story was that for some reason the deal fell through and the system was sold when the firm went out of business.

It was just as well that the neighbour had decided against "seeing what would happen" as the largest power transformer was rated at 2000 volts at goodness knows how many milliamps. Apart from this, the whole of the wiring was done with rubber-covered hook-up wire, which had well and truly perished. I cannot remember what the valves were in this amplifier except that they were very large transmitter-type triodes — four in push-pull parallel for the output stage.

I guess Syd could not resist this huge unit — full of triodes!

Anyway, the transformers are still okay and one day will make a very big contribution to a linear amp. **ar**

Remember to leave a three second break between overs when using a repeater

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International Reply Coupons

Just before I went to the post office this week (7 Jan) to swap some IRCs for stamps, I happened to have a look in the back of the Postal Charges booklet (effective 3 September 1990 edition). I looked under IRCs and noticed this little paragraph tacked on the end which read, "Note: As from 1 January 1991 the coupon will be exchangeable for airmail postage for a standard article up to 20g." Hmmm, very interesting, I thought. How are they going to work this, as the rate for a standard article under 20g varies, depending on where it is going, between $0.85 and $1.50. Anyway, off I went to the Post Office, and asked the unsuspecting lady behind the counter what amount of stamps can I get for an IRC. Eighty-five cents was the answer. At this point I whipped out my postal charges booklet and showed her the little paragraph about the new rate, effective 1.1.91.

Oh!" she said, "I'll have to ask about that." Anyway, a couple of minutes later, she returned to tell me that I could get $1.20 worth of stamps for each one now. ($1.20 is the average of the minimum and maximum listed above). Needless to say, this made me very happy, as the pile of IRCs I had in my hand had just increased in value by about 40 per cent. At this time, I handed over 151 IRCs and walked away with $181.20 worth of stamps. These same 151 IRCs were worth only $128.35 on 31 December 1990. The upshot of all this is that I think the postal people have finally got it right, ie an IRC costs $1.35 and you get $1.20 in stamps for it, which is a much better ratio than a $1.35 outlay for a $0.85 return, which was the case before. I didn't really mean to waffle on about IRCs so much, but most award and DX hunters will have quite a few of these, and may be selling themselves short by selling them for a small price, and probably will not be aware that their redeemable value has gone up. I would, at this point, also like to give full marks to the lady at Greensborough Post Office for her patience and understanding in counting out 151 IRCs etc. I have had some quite unpleasant experiences redeeming IRCs, but this was not one of them. So, anyone from Australia Post reading, please note we don't always give you bad press.

Address for awards

As you may or not know, the correct address for all correspondence for the Awards Manager is the address above (PO Box 300). I raise this, as I have had reports of people just giving my callsign and address in the callbook as the address for the WIA Awards Manager. This concerns me, as I don't want to end up in the same situation as previous award managers who still keep getting mail at their home address for years after relinquishing their role. So, if you are asked for the address for the WIA Awards Manager, please give the address at the top of the column.

Other Awards Available Through WIA

Last month I listed all of the WIA Federal Awards. This month I would like to list a few more awards from the ARRL for which I can verify the cards, to save sending them to the ARRL in the USA. These are very popular awards, and I feel it would be worthwhile to list the rules in full, and will endeavour to do so in the coming months when space permits. In the meantime, if you need a copy of the full rules, I will send them to you provided you send an SASE. I also have application forms which you will need to apply for these awards. I would also like to point out that I will be giving all cards for these awards a very close inspection, as my credibility as an awards manager is on the line. So, please, before sending, double-check cards to make sure they comply with the rules. In particular, pay attention to alterations of any kind, as well as making sure all the required information is listed.

You should also provide an SASE to enable easy return of your cards.

Worked All States

The WAS (Worked All States) award is available to all amateurs worldwide who submit proof (written confirmation) of having contacted each of the 50 states of the USA. The WAS awards program includes 10 different and separately numbered awards as listed below. In addition, ENDORSEMENT stickers are available as listed below.

Separately numbered awards —	OSCAR
	SATELLITE
	SSTV
	RTTY
	432MHz
	220MHz
	144MHz
	50MHz
	160m
Endorsements —	SSB
	CW
	NOVICE
	QRP
	PACKET
	EME
	ANY SINGLE BAND

VUCC

The VHF/UHF Century Club Award (VUCC) is awarded for contact with a minimum number of Maidenhead 2^0 x 1^0 grid square locators per band. The minimum number of squares needed to qualify for each individual band award is as follows:

50MHz —	100
144MHz —	100
432MHz —	50
1296MHz —	25
2.3GHz —	10
above —	5

WIA Grid Square Award (WIAGSA)

I will allow one month for input on these new amended rules, which take into account most of the feedback I have received. The rules in their present proposed form allow a person who operates from home to have just as much fun as someone who can operate only portable. There is a heavy emphasis on portable operation. I hope this will encourage as many people as possible to operate portable, perhaps from as many as 100 different grid squares. This will not only improve their own scores, but may assist up to 500 people to gain new squares. So, as you can see, there is something in it for everyone.

As for being able to work only VK stations, I was going to drop this completely. However, I think it would be a good idea to make it so that a small portion of the contacts need to be VK, to encourage contacts with VK stations, and also to give it an Australian flavour — hence rule 6(b). This is a compromise between the original and some of the letters I got. The VK content applies only to the **basic** award.

The minimum number of contacts needed to qualify has been reduced on some bands, as some felt them a little too high and, on reflection, I agree. My main aim is to get people qualified and then keep them chasing after update stickers. If you want something harder to chase after, try VUCC. I think it is important not to lose sight of the fact that if you are only interested in seeing how many different locators you can work from one QTH, then VUCC is your baby. This award seeks to be **different from others offered** as well as being a challenge. While your tally will not really be the actual number of different squares you have worked (if you use rule 5), it will, however, be a measure of the amount of effort you have put in.

I have tried to keep the rules so that they are interesting for all concerned.

Redrafted Draft Rules

1. (a) The Wireless Institute of Australia Grid Square Award (WIA GSA) is awarded for contact with a minimum number of Maidenhead 2^0 x 1^0 grid square locators per band as indicated in (b). Grid squares are designed by a combination of two letters and two numbers.

(b) The minimum number of squares needed to initially qualify for each individual band awards is as follows:

All HF bands, including WARC bands	—	100
50MHz	—	50
144MHz	—	30
432MHz	—	25
1296MHz	—	10
13cm	—	5
all bands above	—	5

2. Only contacts made on or after 1 January 1990 are creditable for this award.
3. a) Individual band awards are endorsable in the following increments:
   — All HF bands 25
   — 50MHz + 144MHz 10
   — 432MHz + all bands above 5
   b) Separate bands are considered as separate awards.
4. a) No crossband contacts permitted
   b) No contacts through **active** repeater or satellite devices or any other relay method permitted
   c) Contacts with aeronautical or maritime mobile stations do not count
5. Stations which operate portable or mobile from a different locator to their "home" locator may claim the locator they are **operating portable from,** by either of two methods:

1. work a station located in their "home" locator
2. or work at least five different stations outside the portable locator (on bands 1.2GHz and above work at least one station outside the portable locator).

6. All contacts for all of the individual band awards must be made from a location or locations within the same grid square, or locations in different grid squares no more than 50km apart. This will be called the "home" locator. Excepting contacts made under the provisions of Rule 5.
   b) A minimum amount of contacts for the basic award need to be made with stations located in Australia or its territories (ie any prefix VK0 to VK9) as per the table below:
   All HF bands 25
   50MHz 10
   All other bands 1
7. Endorsements will be available on request, ie how ever you want it endorsed is how it will be done.
8. a) QSL cards are not required. A certified log extract should be provided with the following information:
   — Date, time, callsign, mode, frequency, grid locator and signal report sent by the station concerned and grid you are operating from, if portable.
   This list should be certified by an official of a society affiliated with the WIA, or by two licensed amateurs, reading as follows — "I/we certify that the enclosed list corresponds with the information contained in the said logbook."
   b) For those who would have difficulty in getting a certified list, photocopies of your logbook signed by the applicant certifying all the information contained within to be true and accurate can be certified by the awards manager.

Note: All entries must be legible.

9. The cost for each award is $A5 or eight IRCs for amateurs in Australia, or $US5 or eight IRCs for those outside Australia. Requests for endorsements should be accompanied by an SASE or one IRC and SAE.
10. This award is very much dependent upon the honesty of the operator. Any fraudulent applications will result in the disqualification of the applicant from all future WIA GSAs.
11. Any decisions regarding interpretation of the rules here printed made by the Federal Awards Manager are final and binding.
12. There will also be a standing list of the top five scorers on each band so that people can see just what is possible and what is being achieved. This may encourage those who think they will never reach their target. It will also give those who like a bit of competition something to aim for.

CQ Magazine Awards

In the January '91 column I made mention of the fact that Bill Vogel (VK5NVW) is an authorised checkpoint for *CQ* magazine awards, and can supply rules, application forms and check cards. I also mentioned that Bill didn't actually say so, but an IRC or SAE probably would be appreciated. Well, he wrote to me again and said yes, this is the case. He and the other voluntary checkpoint in Australia for *CQ* magazine awards do not receive any financial support from *CQ*, and therefore it is imperative that you include either SASE (prefers 9" x 4") or sufficient funds to cover envelope and postage. He informs me that VK6JS is also a checkpoint. Bills address is:

Bill Vogel
16 Wandilla St
Largs Nth
SA 5016

Charges for awards

You would not believe the number of applications for awards that I get with absolutely **no** IRCs or money. While I am aware that there is at least one awards guide that lists our awards as FREE, the majority of these moneyless requests come from one particular large and prosperous state in the USA. I find this rather amusing, as it would be the last place that you would think that anybody would be short of a quid. I remember when I used to get a lot of cards from the USA as FK1TS that nearly all the cards from this particular state sent no money or IRCs or SASEs. So if you are talking to someone who is thinking of applying for an award please remind them of the current charges: ($US5 or eight IRCs). I have a policy at the moment of sending awards to people who send less than the required amount and enclosing a very politely worded request for the additional amount of IRCs. I have had a very good response to this, with nearly everyone sending the difference. In most cases, the information they have lists the old amount ($2) as the price was put up only recently. Those who don't enclose any funds at all get put on the bottom of the pile, and that's how it will stay.

73 PHILL VK3JFE/FK1TS

ar

CONTESTS

NEIL PENFOLD VK6NE
CONTESTS CO-ORDINATOR

Alara Contest Results

As you can see the list is not very long this year — only 26 logs received! I am rather disappointed to find that at least 10 ALARA members who took part in the contest did not bother to send in their logs. Some of them would have had higher scores than some who DID send their logs! Come on girls — surely all of you can spare enough time to write that log and send it off — after all, you made time to participate on air. I am again daring to hope that the response will be better in 1991. It doesn't matter how small the score — let us all know YOU were there!

Alas there were NO novices on air this time, so there will be no Florence McKenzie award. I also found that some members had not re-read the rules this year, thus missing the alteration to the CW scoring! If YOUR score is less than you thought, that will be why — CW now only scores double points if one operator is a novice.

We suffered from some of the same problems again this year — lousy conditions and another contest! Our winner, Bev VK6DE, managed to turn the other contest to her advantage (losing sleep, but gaining points). Congratulations Bev on a great score — I think we'll all move to Geraldton for better DX! Congratulations also to Zdena OK2BBI for gaining the trophy as top DX YL. I tried to catch you Zdena, but just never got through! It is also a great pleasure to give Ivor VK3XB another certificate as top OM — good work Ivor.

Comments from those taking part:

Erika VK3AEB: I found everyone very friendly — it was not as competitive and aggressive as some contests.

Dawn ZL2AGX: Many girls I just couldn't copy — propagation was not very good.

Joy VK2EBX: I enjoyed the contest very much.

Elizabeth VE7YL: I could have worked 2000 OMs from Japan!

Poppy VK6YF: I think it would be difficult to find a weekend when there wasn't another contest.

Bron VK3DYF: Comment from an OM that YLs were chatting (that's why we're on, isn't it?) — another OM complimented us for giving correct signal reports.

Bev VK6DE: Took a week to catch up on lost sleep! Worked 31 members in seven countries, 41 YLs in 10 countries and worked 35 countries!

Meg VK5AOV: Thoroughly enjoyed the contest although it was hard work at times.

Anne ZL2BOV: Should have worked SWL as I heard many girls who couldn't hear me. (I know how you feel, Anne).

Diana G4EZI: See you all next year.

Dorothy VK2DDB: I enjoyed listening, and emptied the mending basket during the contest. (Yes, we knew conditions were bad — but . . .)

So there we are — another contest been and gone, but still enjoyed despite everything. I've enjoyed getting the logs, so keep them coming next year. See you then!

Results of the Tenth ALARA Contest, November 1990

Marilyn VK3DMS
Contest Manager

1.	VK6DE	Bev	816	Top score overall, top phone, top VK6 ALARA member, top VK YL trophy.
2.	VK3CYL	Kim	550	Top VK3 ALARA member
3.	VK3KS	Mavis	328	
4.	VK6YF	Poppy	258	
5.	VK3EBX	Joy	256	Top VK2 ALARA member
6.	VK5AOV	Meg	216	Top VK4 ALARA member
7.	VK3AEB	Erika	213	
8.	VK3XB	Ivor	207	Top OM
9.	VK5BMT	Maria	152	
10.	OM6BBI	Zdena	141	Top Czech ALARA member, top DX YL trophy
11.	GM4YMM	Christine	117	Top European YL non-member
12.	VE7YL	Elizabeth	107	Top VE ALARA member
13.	ZL1ALK	Celia	104	Top ZL ALARA member
14.	ZL2AGX	Dawn	103	
15.	VK3DYF	Bron	94	
16.	ZL2BOV	Anne	94	
17.	G4EZI	Diana	87	Top UK ALARA member
18.	DF2SL	Anny	82	Top German ALARA member
19.	VK4VR	Val	80	Top VK4 ALARA member
20.	VK3DVT	Valda	76	
21.	VK3XF	Les	75	
22.	VK5ANW	Jenny	55	
23.	VK2DDB	Dorothy	53	
24.	WA2NFY	Lia	51	Top US non-member
25.	WB3CQN	Ruthanna	40	Top US ALARA member
26.	VK3DMS	Marilyn	Check log	

13 VK ALARA members
3 DX ALARA members
2 DX YL non-members
2 OMs — 26 logs in total

1990 K-ZL Oceania
VK and ZL Phone Results

ZL PHONE

	160M	80M	40M	20M	15M	10M	
ZL1BVK	1600	8820	19758	416	1450		158064
ZM1IM		420	40	324	48480	1950	101232
ZL2AFY		31200					31200
ZL2ANR	5200						5200
ZL3TX	2240	8360	45	289	1188	32	59422
VK PHONE							
VK1NTW					62920		62920
VK1PJ		2340		22852	108480	103600	794555
VK1ZX					63250	10494	125664
VK2APK	420	2400	450	47300	133176	20856	774276
VK2AYK	160	2100		9744	67056	7980	303008
VK2BAM		160		1254		20424	39294
VK2CCK						67944	67944
VK2CJH		960		256			3264
VK2CKW		2400		196	3780	850	31312
VK2PS	1080			2958		1936	25754
VK2PWS					12850	60962	213962
VK3DZM		60140					60140
VK3SM		1260		3591			13398
VK4LT						297850	297850
VK4MWZ					217404		217404
VK4NEF	960				62118	38272	231702
VK4OD						17820	17820
VK4PJ		160	10		33464	1680	66640
VK4YB	6300	13800	36180	72877	12772	6000	1060645
VK5GN						77004	77004
VK5HB		490		48840	51360	30096	431680
VK5PJV		250			70692	20770	182508
VK5QX				145672			145672
VK6ANC			6510	4524	27548	50160	304288
SVK6HQ		4680		16611	32	180	62640
VK7MC							
VK8BE						14040	14040
VK3AEO	Check Log					264	264

VK AND ZL CW RESULTS

ZL CW	160M	80M	40M	20M	15M	10M	
ZL1AIH			314860				314860
ZL1AIZ	180	9250	68160	7000	14060	8512	512568
ZM1BSG					82360		82360
ZM1HV		1080	14400	3588	2400	17120	171477
ZM2AGY		2160	39050	19008	45310	8030	522006
VK CW							
VK2APK	80	2210	96120	83640	50096	13936	1117754
VK2BQQ		1760	15870	26040	48108	19500	516890
VK2DID		1080	6450	3408	46736		165636
VK2CWS					42180		42180
VK2KM			40150	4218	52216	27632	464440
VK2PS	320	1620		9796	1040	7280	94464
VK3AOR		880			35148		47742
VK3EGN				137160	125280	20124	768108
VK3MJ				29016			29016
VK4DWA					78880		78880
VK4MWZ					5934		5934
VK4OD						18576	18576
VK4TT				143716			143716
VK4XA						184896	184896
VK5ZN				3036	8	8	4264
VK6AJ					49184	124806	330694
VK6HG		40	10	8892	10450	32032	154080
VK6HQ				11284	98	17928	64074
VK6NZ				54587			54587
VK6ZH				2050	2300	31310	75485
VK7GB						286	286
VK7RY		100		270	448	32	5846
VK8AV		30250	14850	41600	40460	21746	778674
VK8BE						2240	2240

From R J Litten ZL1AAS VK-ZL-0 Contest Manager

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AUSTRALIAN TELEVISION FREQUENCIES

Ch	Limits	Video	Audio
0	45-52	46.25	51.75
1	56-63	57.25	62.75
2	63-70	64.25	69.75
3	85-92	86.25	91.75
4	94-101	95.25	100.75
5	101-108	102.25	107.75
5A	137-144	138.25	143.75
6	174-181	175.25	180.75
7	181-188	182.25	187.75
8	188-195	189.25	194.75
9	195-202	196.25	201.75
10	208-215	209.25	214.75
11	215-222	216.25	221.75
28	526-533	527.25	532.75
29	533-540	534.25	539.75
30	540-547	541.25	546.75
31	547-554	548.25	553.75
32	554-561	555.25	560.75
33	561-568	562.25	567.75
34	568-575	569.25	574.75
35	575-582	576.25	581.75
36	582-589	583.25	588.75
37	589-596	590.25	595.75
38	596-603	597.25	602.75
39	603-610	604.25	609.75
40	610-617	611.25	616.75
41	617-624	618.25	623.75
42	624-631	625.25	630.75
43	631-638	632.25	637.75
44	638-645	639.25	644.75
45	645-652	646.25	651.75
46	652-659	653.25	658.75
47	659-666	660.25	665.75
48	666-673	667.25	672.75
49	673-680	674.25	679.75
50	680-687	681.25	686.75
51	687-694	688.25	693.75
52	694-701	695.25	700.75
53	701-708	702.25	707.75
54	708-715	709.25	714.75
55	715-722	716.25	721.75
56	722-729	723.25	728.75
57	729-736	730.25	735.75
58	736-743	737.25	742.75
59	743-750	744.25	749.75
60	750-757	751.25	756.75
61	757-764	758.25	673.75
62	764-771	765.25	770.75
63	771-778	772.25	777.75
64	778-785	779.25	784.75
65	785-792	786.25	791.75
66	792-799	793.25	798.75
67	799-806	800.25	805.75
68	806-813	807.25	812.75
69	813-820	814.25	819.75

New Zealand VHF Channels

1	44-51	45.25	50.75
2	54-61	55.25	60.75
3	61-68	62.25	67.75
4	174-181	175.25	180.75
5	181-188	182.25	187.75
6	188-195	189.25	194.75
7	195-202	196.25	201.75
8	202-209	203.25	208.75
9	209-216	210.25	215.75
10	216-223	217.25	222.75
11	223-230	224.25	229.75

TV Carriers: 45-644MHz

All Australian stations are shown, but the NZ list includes only high-powered stations.
NZ1, NZ2 = BCNZ Network 1 or 2. /T=translator

Ch	Video	Audio	Call	Location	Pol	Pwr
1	45.240	50.740	NZ2	Mt Studholme	V	100k
			NZ1	Te Aroha	V	100k
	45.250	50.750	NZ1	Kaukau	H	100k
			NZ1	Hedgehope	H	100k
	45.260	50.760	NZ2	Hikurangi	H	100k
			NZ1	Whakapunake	H	100k
0	46.172	51.672	DDQ	Toowoomba	H	200k
	46.240	51.740	ABMN	Wagga	H	100k
			ABSN/T	Cooma	M	35
			ABUN/T	Glen Innes	H	25
			ABWN/T	Narooma	H	500
			ABNT/T	St Helens	H	30
	46.250	51.750	ABN/T	Goulburn	V	50
			ABMQ/T	Nebo	H	100
			ABNQ/T	Gordonvale	H	500
	46.258	51.758	ABCN/T	Wallsend	H	100
	46.260	51.760	NEN/T	Tamworth	H	1k
2	55.240	60.740	NZ1	Waiatarua	H	100k
	55.250	60.750	NZ1	Wharite	V	100k
	55.260	60.760	NZ1	Dunedin	H	100k
1	57.100	62.600	ABNT/T	Wynyard	V	1k
	57.240	62.740	NEN/T	Walcha	H	100
			ABSN/T	Eden	H	50
			ABGV/T	Eildon	H	5
			SEQ/T	Gympie	V	3k
			ABTQ/T	Townsville N	H	10
			ABT/T	St Marys	V	100
	57.250	62.750	ABTN	Taree	V	100k
			ABAV	Albury	H	100k
			ABNQ/T	Mareeba	H	16
			ABGS	Mt Gambier	H	100k
			ABNS	Port Pirie	V	100k
			ABNT/T	Launceston S	H	30
	57.258	62.758	ABCN	Orange	V	100k
			NBN/T	Murrurundi	H	50
			TNQ/T	Bowen	H	5k
	57.260	62.760	ABEV	Bendigo	V	100k
			ABSQ	Warwick	H	100k
			ABNQ/T	Babinda	V	300
			ABT/T	Rosebery	H	50
	58.350	63.850	ABWQ/T	Monto	V	1.2k

This data is an overflow from the February data issue – it simply wouldn't fit. Ed)

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HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93 DURAL NSW 2158

Like the solar cycles, WARC (World Administrative Radio Conference) gatherings come and go at regular intervals. The last one was at the end of 1979, the next one will be held early in 1922 in Spain.

One would ask, "What has WARC to do with DXing?" The answer is simple: quite a lot! "Our bands" ("our bands" by the grace of the politicians and the administrative apparatus behind them who allocate these bands to us) are under threat again. As the population of the earth grows, so grows the pressure for new allocations in the spectrum. The win for certain parties must mean a loss for others. Radio amateurs who, since World War I, pioneered by experimentation and research the application of communication in the "useless spectrum 200 metres and under", will be ultimately the losers.

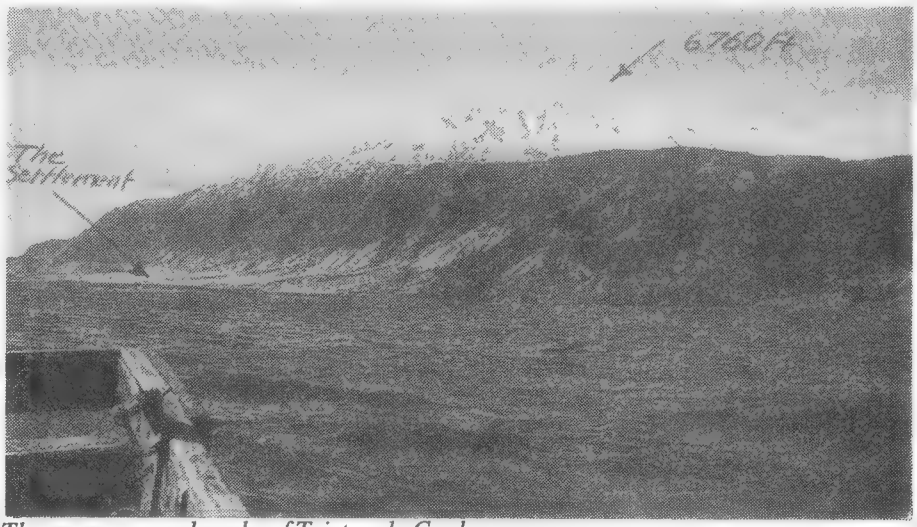
Government demand — political, economical and military — claims more and more of that part of the spectrum which was traditionally regarded as belonging to radio amateurs. Under threat are the HF bands, especially 7MHz, and the VHF, UHF and SHF bands. The demand for allocation for satellite communication, digital and wireless personal communications — the point to point — is growing every day.

What can the ordinary amateur, the hobbyist in the true sense, do to defend "our" bands?

We should all rally behind our national amateur organisations (WIA, NZART etc) which decided to represent us, the members, at the crucial negotiations in Spain. Rally not only in spirit, but also with money. We all know that representation costs money. You, as a DXer, can help. Please send your donation to your WIA Division, with the specific request that it should be forwarded to the Federal Office for the "WARC Fighting Fund". We need all your help to retain our present band allocations.

Albania — ZA

It was in the middle of last year when the first rumours started to emerge about a proposed Albanian activity. Peter HA5WE and Zoli HA5PP, known from their Vietnamese experiences, were the ones who, according to expert observers, were to carry the torch of amateur radio back into Albania. Nine months later, the proposed expedition has not yet taken place. *The DX Bulletin*, which is pub-



The snow covered peaks of Tristan du Cunha

lished in the USA, has surveyed its 9000 readers about the most wanted countries as far as DX is concerned. On the top of the lengthy list is Albania. Eighty-nine per cent of the readers need this country. However, some small progress has been made. The October 1990 issue of the *News Bulletin of the MRASZ* (The Hungarian Radio Amateur Society) published some facts about the proposed activity:

a) There is now an agreement between the Hungarian and the Albanian Radio Amateur Societies that there will be a future DXpedition to Albania for a period of 15 or 20 days, with the participation of 10 amateurs. This agreement has to be approved and ratified by the relevant Albanian authorities.
b) An Albanian amateur delegation has visited Hungary, including the President of the Albanian Amateur Radio Society.
c) The MRASZ has called for volunteers to take part in the expedition. All the chosen expeditioners have to pay their own expenses. So far, 19 amateurs have applied, but only 10 will be selected according to a very strict selection criterion.

It appears that the fate of the Albanian DXpedition hinges now on the political development in Albania, and is subject to the approval of the Albanian authorities.

Afghanistan — YA0RR

This is the third-most-wanted country in the survey conducted by *The DX Bulletin*. Seventy-six per cent of the readers need this country for their DXCC certificate. This demand was somewhat reduced during January 1991. Romeo Stepanenko (see February *AR)* came up on the bands on 5 January. His appearance was preceded by some pirate activity. He was allowed to use only 30W output and wire antennas, due to the hostilities which are still around Kabul, the capital of Afghanistan. The proposed move to a different location with greater power and different antennas did not eventuate.

Romeo and his friend Larry YL1WN were very active on CW with only an occasional call towards VK/ZL. A few lucky VKs worked them; others (including yours truly) have heard them but were not able to work them. Some others did not even hear them. The bedlam on 14195 and at 1255 UTC on 21295 had to be heard to be believed. In my opinion, the behaviour of some amateurs was worse than when Bouvet was on. The Europeans came to the fore with rude and derogatory comments about each other's ancestry and nationality. There were quite a number of false reports acknowledged by "policeman". It still amazes me that some so-called DXers do not know what a split frequency is, and how to handle it. They barge into the mob and do not listen before. Romeo closed the YA station on 21 January. The QSL information is not quite clear on this operation. Some DX publications say that you should send your cards to: Romeo Stepanenko, Box 812, Sofia, 1000, Bulgaria; others advocate the old Moscow address: Box 308, Moscow, 103009 USSR. Take your pick. At the end of January, unconfirmed reports said that Jackie F2CW, who is connected with the International Red Cross, was active from Kabul as YA0/F2CW.

Canton Island — Kiribati — T31

During the past year, all the call areas of this island nation (T30-T32-T33) were activated except T31. Kiyoko, the Japanese lady DXer, known also as NH6RT, T30KY, ZK1BY, ZK1XY, T22KY, YJ0AKY, 5W1HM, ZK3KY etc — who missed the Banaba T33 operation — managed to activate Canton Island on her own, under the callsign T31KY. She was heard on the usual DX frequencies. Now we are all waiting to receive the magical card from: Kiyoko Yamakami, Box 3, Tokaimura, 31911, Japan.

Saint Helena ZD7, Ascension ZD8 and Tristan Da Cunha ZD9

Bill VK4UA was kind enough to supply me with some information about the amateur activities on the British Islands in the Atlantic. Bill tries to maintain regular skeds for the benefit of VK-ZL-Pacific DXers, with these islands along the following lines:

ZD7 around 2000 to 2100 UTC. ZD8 the same time, on the hour on the calling frequency of 21260.

ZD9 around 0700 to 0715 UTC on 14165kHz long path. For the novices there is a possibility at 2100 UTC with Bob ZD8BOB on 21195kHz.

These are the stations which you might be able to work: ZD7DP Desmond, QSL to Box 86, St Helena Island, South Atlantic. Maggie ZD7SM (XYL of Desmond) ZD7VC, Bruce, Box 58, St Helena, South Atlantic. The island covers 48 square miles, with a general population of 5000 to 6000, and with 11 active amateurs, who are all anxious to contact their VK/ZL counterparts. The best path is over VE7 between the hours of 1900-2100 UTC on 21260kHz. The mail boat comes to St Helena around every five weeks. ZD8BOB Bob, PO Box 2, Ascension Island, South Atlantic. He can be worked around 1900 to 2100 UTC on 21260kHz long path. ZD8LII Steve, Box 2, Ascension Island, long path, same time. ZD8DX Dave, 2015 UTC. QSL to: WB2K. Bob is keen on propagation reports and checks regularly on 14165 kHz at 0700 and 0730 UTC long path for VK, and shortpath for ZL. The area of Ascension Island is 34 square miles, population about 1200, 12 radio amateurs, of which six are active. Green Mountain is about 2600 feet high. ZD8 has the second longest airstrip in the world and gets an almost daily air service. ZD9 Andy and his wife Lorraine ZD9C0 can be heard every second Monday on 14165kHz long path, around 0700 UTC, and they can also be found on 21330kHz around 1950 UTC, long path. (See Nov 1990 issue of *AR).*

Saint Peter and Saint Paul Rocks — PY0S

I have some further news about this proposed DXpedition. (See February *AR).* The rocks are located at 0° 56' north latitude, and 29° 21' west longitude, about 1100km east of the coast of Brazil in the Atlantic Ocean. This will be the second DXpedition to these tiny rocks by the Natal DX Group, Brazil. (See article about the 1989 expedition in August 1990 issue of *AR).* There will be two stations, both active at the same time, 24 hours a day, on SSB, CW and RTTY, from 10m to 160m, including the WARC bands. Transportation will be in a 15m-long sail-boat, and the trip will take five days. Total cost of the expedition is $US11,050, of which the members of the expedition have already contributed $US2500. They still need $US8550 to get the expedition under way. Send your donation by registered letter to: The Natal DX Group, Caixa Postal 597, 59022 Natal, RN, Brazil.

Maritime Mobile

Hungary is in the middle of Europe and is not known as a maritime nation. However, from time to time it produces some extraordinary navigators. The latest is Steve HG5S/MM. He left Gibraltar on 29 July last year, sailing single-handed in a 31ft sloop, the "Salammbo" around the world, with only one stopover, in Fremantle, Western Australia in December 1990. There he attended to some urgent repairs to his boat, replenished his provisions, and on 29 December left the shores of VK6. He kept in constant touch with the "Travellers' Net" on 14116 each day. The net is under the control of Roy VK6BO. When sailing south of New Zealand, he joined the maritime net of Tony ZL1ATE, assisted by Les ZL1BIN, who gave Steve the daily weather reports. Steve expects to complete his circumnavigation of the earth on 29 June 1991.When I caught up with him in a QSO at the end of January, his position was 48° 45' south latitude, and 176° 41' west longitude, on his way towards the Horn. Steve expressed his thanks to the VK6 amateurs who were kind enough to make a considerable cash donation towards his repair costs. He is financing the whole trip himself, and does not have any sponsors. He confessed to me that basically he is a "yachtie", however this voyage opened his eyes as far as the amateur fraternity is concerned, and he is grateful for the assistance and help he received via the medium of amateur radio. he has an FT747GX on board. He admired the selfless dedication of the various net control-

lers, and asked me to convey his personal thanks to all those who helped and assisted him whilst in the VK and ZL waters.

Speaking of yachties, our readers might remember the other Hungarian sailors Nandi and Joe who, in 1986/87, sailed around the world in a small sloop, equipped with amateur radio and the callsign HG4SEA/MM. One of these adventurers, Nandi, surfaced in January 1991 as one of the participants in the BOC single-handed Around the World Boat Race. This race is for the Big Boys. He carries amateur radio again, and his callsign is HA4WM/MM, and his next stop will be in Punte Este, Uruguay at the beginning of March 1991.

Niue — ZK2

Eli HA9RE and Miki HA8XX were operating from Niue late January to middle of February as ZK2XA and ZK2XB. From there they went to the South Cook Islands: ZK1. Whilst on Chatham Islands ZL7, they made 31,000 QSLs. QSL to their manager: DJ1ND (See February *AR).*

Interesting QSOs and QSLs Information

Note: callsign, name, frequency, mode, time in UTC, months of QSO. ADAR = QSLinfo

* 8P9/XE1L-Luis-14160-CW-2158-Dec. QSL to: WA3HUP=ADAR.

* 7Q7RM-Ron-28030-CW-1252-Dec. QSL to: K6KII=Clifford G Moore, PO Box 1338, Arcadia, 60611, Ill, USA.

* A92C-Ravi-14015-CW-1708-Dec. QSL to: The Manager, PO Box 10043, Bahrain, Middle East.

* TU4CO/TT8-Antonio-14012-CW-1730. QSL to: The Manager, BP7, MerleVenez, 56700, France. Antonio has only verbal permission to operate.

* ZS6/G3SGQ-Ron-21013-CW-0642-Jan. QSL to: home call via Bureau.

* TR1XX-Paul-14025-CW-2041-Jan. Not yet in the callbook. Try to send to: AGRA, Box 1826, Libreville, Gabon, Africa.

* FP5HL-Henri-14027-CW-2133-Jan. QSL to: Henri Lafitte, Box 1107, Saint Pierre Island, Atlantic Ocean.

* 7X5AV-Djamal-14033-CW-0800-Jan. QSL to: Djamal Bendaud, Maison De Jeunes, 23, Bou Saada, Algeria, Africa.

* 5T5/N5JRC-Gene-21298-SSB-2152. QSL to: WA5ZIJ Gene A Hill, 1828 N Harco Dr, Baton Rouge, LA, 70815, USA.

* C53GH-14240-SSB-2012. QSL to: The Manager, PO Box 92, Banjul, The Gambia, Africa.

* V63NW-Bob-14226-SSB-1223-Jan. QSL to: DF6FK via the Bureau.

* CE0ZTY-Rosita-(YL)-14143-SSB-1133-Jan. QSL to: Ms Rosita Rojas, PO Box 1972, Valparaiso 1, Chile, South America.

* ZP5CGL-Carlos-21244-SSB-0514-Jan. QSL to: The Manager, Box 512, Asuncion, Paraguay, South America.

* OA4BHM-Gloria-(YL)-14222-SSB-0557-Jan. QSL to: Gloria Maria Munoz De Layness, PO Box 4939, Lima, 100, Peru, South America.

* 9M8AJ-Alan-14192-SSB-1104-Jan. QSL to: AA5AZ Alan J Clarke, 1102 Lake Ave, Metairie, LA 70005, USA.

* 4Z80TA-Udi-14188-SSB-0536-Jan. QSL to: Home Call 4X6ZM via Bureau.

* KP2J-Pat-10101-CW-1050-Jan. QSL direct only: Henry T Miller, PO Box 1853, Charlotte Amalie, Virgin Islands, VI 00801 USA.

*V63JC-Father Cav-14226-SSB-1149-Jan. QSL to: Joseph A Cavanagh SJ, PO Box 39, PATs, Pohnpei, FM 9641 USA.

*9Y4SF-St Clair-14226-SSB-1139-Jan. QSL to: St Clair Forde, Cardi Uwi, Saint Augustine, Trinidad, West Indies.

*XF3RGS-Salvador-14166-SSB-0628-Jan. QSL via the XE Bureau or direct: The Manager, PO Box 1, Cancun Island, Yucatan, 77505, Mexico.

RTTY News

Syd VK2SG supplied the following information:

* UF6FJ-21087-1240Z. QSL to: Box 120Tblisi, 380008, Georgia, USSR.

* ES1RA/UI5F-14083-1450Z. QSL to: Box 806, Tallin, 200017, Estonia.

* A92FG-14073-2000Z. QSL to: Box 22381, Muharah, Bahrain, Middle East.

* YS/WD4IFN-21083-1517Z. QSL to: Herman H Franks, US Embassy, APO Miami, 34023, Fla, USA.

* UL7LR-14085-1505Z. QSL to: Box 97, Dzhetygara, 459430, Kazakh, USSR.

* VP8CEL-21091-0052Z. QSL to: G4PVM.

* LY2BBF-21084-1233Z. QSL to: Box 1029U, Vilnius, Lithuania, 232012, USSR.

* ZB2JB-21088-2020Z. QSL to: Box 292, Gibraltar, Europe.

* VP2EE-21087-1335Z. QSL to: KA3DBN.

* 3B9FR-14091-1902Z. QSL to: Box 31, Rodriguez Island via Mauritius, Indian Ocean.

* 9M6/JH1ROJ-21086-0229Z. QSL to: Home call.

From Here and There and Everywhere

* Bernhard DL2GAC is on a South-East Asia-Pacific DXpedition. He left Germany in January and will operate in the next five months as VU2BMS-9V in Singapore, YB5NOC-9M2QR-9M8QR-DU1 in the Philippines, C21 in Nauru, H44MS and other localities. Bernhard is a strong supporter of the IOTA award system, and is asking stations working him to make one contact per island only.

* Please note: when sending direct QSLs to Pakistan send IRCs only. Green stamps are not welcome there if they are sent via the mail.

* From 3 February, the airmail postage from the US to other parts of the world will be US$0.50 instead of the 45 cents which was charged until now.

* According to Eva PY2PE, Crozet Island will be activated by FT4WC. He was heard on 14115 at 1600 UTC.

* Some of you might be interested to know how the VK DXers rank in the ARRL DXCC Honour Roll. The full list was published in the November issue 1990 *QST* Magazine. Mixed: VK5WO-320/349, VK6DH: 320/339, VK3YL: 319/355— VK6HD: 318/337— VK4QM: 316/364 — Phone: VK5WO: 320/346 — VK6RU: 320/367— VK6HD: 319/337— VK5MS: 318/362 — VK6LK: 318/334 — VK4LC: 315/348. It is interesting to note that no VK station is listed on the CW section of the honour roll. The above list is eight months old, and since that date some changes might have occurred.

* The well-known "Greenpeace" Antarctic Station, Marcus ZL0AIC, closed down on 11 January. His service time expired and he went home. However, you can now have a contact with K5AFJ/ZL5 Walt, who is now on "World Park Base", Ross Island, Antarctica. QSL to home call.

* We might be lucky. It was reported early in January 1991 that Italian technicians are installing three complete radio stations in Ethiopia. IK6DPW is already in the country and hopes to get a licence to be active sometime in February. QSL will go to: I8YCP.

* There was a particularly good opening on shortpath on 13 January to XQ0X. John CE0ZAM, with the help of Mickey CE3ESS, has worked dozens of VK/ZLs. (See January issue of *AR).* John hopes to have his 80m band antenna up in February/March.

* UG1700GAW was celebrating 700 years of Christianity in Armenia. QSL to: UG6GAW.

* Jim VK9NS hopes to be in Bangladesh by the end of February for a few weeks of activity. He also said that he will go to Bhutan with Kirsti VK9NL for two weeks around 3 May. Both destinations are very much sought-after locations. S2 is needed by 62 per cent and Bhutan is needed by 55 per cent of the readers of *The DX Bulletin.*

* QRM, either accidental or intentional, is the curse of the DXer. When talking to Luis CU2EL he bitterly complained about the QRM on 40m when he attempted to have a contact with EA0JC — who is none other than the Spanish King Juan Carlos with the QTH in the Madrid palace.

Monitoring Zedan's net (JY3ZH, 14250) the other day, I was surprised to hear an angry American amateur demanding from Zedan that he should bring JY1 up on the frequency. He wanted to discuss the present Middle East situation with the absent JY1. I think most of us know that JY1 is none other than King Hussein of Jordan. Zedan politely told our friend that JY1 is now busy with non-amateur activities.

* The "HE" prefix can be used by Swiss amateurs during the year of 1991. The Swiss are celebrating the 700th anniversary of the establishment of the Federation of the Swiss

Cantons into one nation. I worked HE7CSA, who happens to be the Award Manager of the Swiss Radio Amateur Society (USKA).

* Had a QSO with Mark VK0ML who is a scientific research officer on Macquarie Island. He is very busy in his profession. He is not a DXer, and uses amateur radio to communicate with his home base in VK5. Here and there he will have a chat with whoever happens to pass by. VK5AHI will collect Mark's cards, addressed c/- VK5AHI, only through the Bureau. Do not expect a reply in a hurry. Mark will reply only after his return to the mainland.

* If you worked T32LN, he is Mr Tekinaiti Kaiteie, and his address is: c/- Ministry of Line and Phoenix Islands Group, Republic of Kiribati, Pacific.

* The well-known net controller, Gray VK4OH ("Family Hour" net 14226.5 at 1100 UTC) has reported recently that in the first 26 days of 1991, 78 different DX countries have checked into that net.

* I was surprised to hear Ian VK5QX active one night from Western Samoa as 5W1JI. Ian was on a very hectic antenna erection tour of duty in the islands, and hoped to work also from Fiji as 3D2QX, and from Tonga as A35QX.

* Jean Louis 6W6JX advises that he discontinued the use of QSL managers. All cards only direct to him: PO Box 200, Kaolack, Senegal, Africa.

* If you hear VK0KC, he is Jim, who just arrived at Casey Base, Antarctica. His QSL manager is Graham VK4BB.

* Karl WB4BCQ, one of the US net controllers on the "Family Hour" net, became a silent key early in January. His rasping voice and his southern drawl will be missed on the bands by many of his friends.

* The 42nd International DX Convention will be held at Visalia, California from 12-14 April this year. If you intend to go, contact Louese Bloom KA6ING urgently at 2520 Heather Lane, San Bruno, CA, 94066 USA. On the other hand, if you wish to attend the 40th Dayton Hamvention (the prescribed pilgrimage for all amateurs) that will take place on 26-28 April. Your contact address is: Dayton Hamvention, Box 1446, Dayton, OH 45401, US.

Interesting QSLs received

It looks like the postal service — direct and QSL Bureau — has stopped?! Any info from others? Are you regularly getting your QSL cards? Drop me a line . . . Direct QSLs received: FW0ET (15W FM OP), T33WV (4W FM OP).

Thank You

I appreciated the help, support and contribution from: VK2DID, VK2SG, VK4BB, VK4DA, VK4OH, VK4UA, VK5WO, VK6PY, VK9NS, HA5HR, HA6NF and the DX bulletins: *QRZ DX* and *The DX Bulletin*. Many thanks to all of you. Without your help this column would not be possible. Keep the information rolling in.

GOOD DX AND 73.

ar

AMSAT AUSTRALIA

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON SA 5074
PACKET: VK5EA@VK5WI

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
Information nets
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC
Sunday bulletin commences: 1000 UTC
Primary frequency: 3.685MHz
Secondary frequency: 7.064MHz
(7.064MHz is the frequency presently in use)
AMSAT SW Pacific 2200 UTC Saturday, 14.282MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional Broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia, and now has over 310 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia, addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001.

The newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a software service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disc and a nominal donation of $10 per item to AMSAT Australia, together with sufficient funds to cover return postage. To obtain details of the programs available, and other AMSAT Australia services, send a SASE to Graham.

AO-16 Notes 13Jan91 from NK6K

Contents:
Comments on <REJ> frames and TNC parameters
Comments on not interfering with software reloads
Comments on uncorrectible SEU file errors

REJ Frames

I've noticed, from watching the downlink, that several users either don't have the proper TNC parameters set, have deaf receivers, are running way too much power, or are transmitting on the wrong frequencies.

The problem is that you are getting <REJ> frames sent to you. This means that PACSAT has received an <I> frame that is out of order or it has received one that it has already seen. This can happen when you are sending data, either uploading a file, or requesting a DIR or download.

The most common reason for getting <REJ> frames is that you transmit more than one frame in a burst (maxframe>1), and the satellite misses the first frame. You then get a <REJ> for the second. As has been recommended several times, you should have maxframe set to 1 for best results, so this should never be the reason. (Hint: change maxframe to 1 if it isn't already).

Another reason is that your TNC times-out before the <rr> frame in response to your <I> frame is sent. Because the downlink is being shared by frames to several other users in addition to telemetry frames, there could be a 2-6 second delay before an <RR> is transmitted. If you have your FRACK set less than 6, you could be retransmitting when you don't need to. (Hint: change FRACK to 6 or larger if it isn't already.

Another reason is that you missed the <RR> (ack) for the frame you sent. Since the <RR> is the shortest frame, and therefore the easiest to receive, either you have a local noise problem or you have a problem with your receive setup. Of course, the more acks you miss, the more time you spend on the uplink, and the less time everyone else gets. This being amateur radio, we encourage experimentation, testing with omni antennas etc, so if this is what you are doing, no problem. However, if you've got store-bought equipment and tracking antennas, there is no excuse for missing acks, something needs adjusting. Get to work.

The final reason for seeing <REJ> frames on the downlink is that you are getting into more than one receiver. The microsat receivers are more sensitive than required for the average user ground station. An AO-13 class station, with 1000W eirp, will probably be heard by more than one receiver at a time, resulting in multiple copies of the same packet being placed in the input queue. Because

there are multiple receivers, all running with interrupts and DMA, the doppleganger packet might not appear directly after the real one in the queue, so they can't easily be filtered out on the spacecraft. In addition to wasting time on the downlink by causing unnecessary <REJ> packets, you are also blocking adjacent receivers from other users.

You can solve this problem by reducing the uplink power, checking to make sure your deviation is 3.5kHz or less, and that you aren't transmitting between receiver frequencies. If tracking doppler by hand, start the pass about 2kHz lower than the published frequency, and end up 2kHz higher than the published frequency. Yes, this is the reverse of the direction the downlink receiver moves. On downlink, you are moving the receiver lower to make up for fast moving fixed frequency transmitter, which appears to be sending at progressively lower frequencies. On the uplink, you are compensating for a fixed receiver, which is hearing you on progressively lower frequencies, so you move your TX frequency up. Trust me on this.

You can see if you are having problems in this area by having a friend watch the downlink while you are logged on. Use the PB header option. If you see too many <REJ> frames sent to you, you have one of the above problems.

While on the subject of TNC parameters, you should set DWAIT to 0. There is no advantage in holding off via this parameter on AO-16. You should also do some testing to determine the proper setting for your TXDELAY parameter, setting it too large wastes channel time. This can be done by ear with a local receiver, or experimentally by digipeating frames while adjusting TXDELAY.

Software reloads

We will, from time to time, be reloading the PACSAT software. We usually try to broadcast a file warning of this a few days in advance. We will be reloading again sometime in the next seven days to add the file wash feature discussed below. If you transmit while we are reloading, it can slow the reload.

If you are having trouble getting connected or digipeating, make some attempt to determine the state of the satellite. On the reload last weekend, all the command stations reported having difficulty getting into the spacecraft. We can only assume that the problem was several users trying to digipeat or connect, even though the BBS was not running and digipeat was turned off.

One user appears in the log with a log-in two seconds after the STARTUP log entry. This user was probably trying to connect from the start of the pass, and had been interfering with the upload for the previous four minutes.

Here is how to tell what state the BBS is in.

By sight: If you see packets to QST-1, the BBS is up. If you see BBSTAT packets, the BBS is up. If you see packets from PACSAT-

SATELLITE ACTIVITY FOR OCTOBER/NOVEMBER 1990

1. Launches

The following launching announcements have been received:

Int'l No	Satellite	Date	Nation	Period min	Apg km	Prg km	Inc deg
1990-							
093A	INMARSAT-2 F1	30 Oct	USA	10h45m	36118	198	23.6
094A	GORIZONT 21	03 Nov	USSR	23h51m	35688		1.4
095A	USA-65	13 Nov	USA				
096A	COSMOS 2103	14 Nov	USSR	92.8	430	410	65.0
097A	STS-38	15 Nov	USA	88.6	221	215	28.4
098A	COSMOS 2104	16 Nov	USSR	90.6	387	247	62.8
099A	COSMOS 2105	20 Nov	USSR	11h49m	39339	606	63.2
100A	SATCOM I	20 Nov	ESA				
100B	GSTAR IV	20 Nov	ESA				
1010A	MOLNIYA 1-79	23 Nov	USSR	12h15m	40593	654	62.9
102A	GORIZONT 22	20 Nov	USSR				

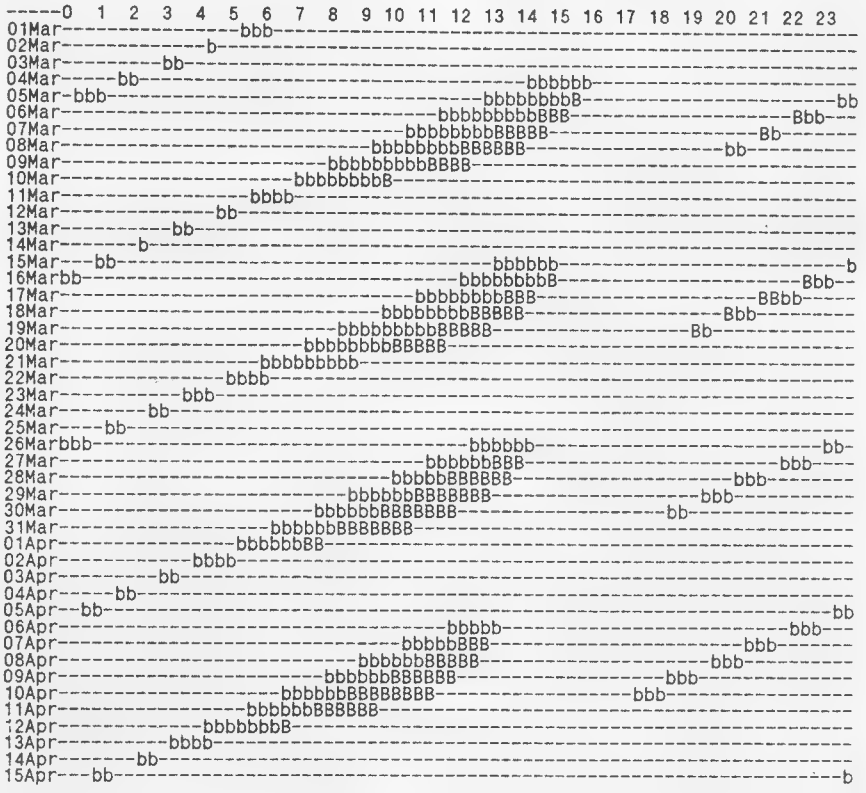
2. Returns

During the period 32 objects decayed, including the following satellites:

1968-017A	EXPLORER 37	16 Nov
1990-012A	COSMOS 2059	12Nov
1990-033A	COSMOS 2072	21Nov
1990-097A	STS-38	20Nov

Bob Arnold VK3ZBB ar

OSCAR-13 Schedule for 01Mar91 to 15 Apr91
Station: Adelaide
Hour – UTC



12 or PACSAT-11, the BBS is up.

Otherwise, if you see packets to LDR, we're loading. Don't transmit.

If you see LSTAT packets with d:0 instead of d:1, then digipeating is off. Don't try to digipeat.

By ear:

If you hear constant packets, the BBS is probably up.

If you hear a short packet about every two seconds, we're probably loading.

We don't expect that you always check the state of the satellite before transmitting. We would expect, however, that after a few unsuccessful log-on attempts, when you don't see the PACSAT-12 busy message, that you would check the state of the spacecraft. An easy way is to run PB, and use H to turn the headers on. You can then see the packet addresses, and look for QST-1, BBSTAT, LDDR etc, as detailed above.

One last comment in this area. Except for command stations while loading, there is never a good reason to keep your transmitter keyed up on AO-16. You are blocking other users who may be using the same uplink, and you are adding to the noise on the adjacent channels, especially if your deviation is too high or you are running too much power. Don't do it. This does not necessarily apply to UO-14, where the smaller number of channels and higher baud rate cause some differences. UO-14 will be the topic of a subsequent message.

SEU errors

Single Event Upsets (SEUs) are bit flips that are caused by charged particles which strike AO-16 in its unprotected position above the atmosphere. These errors show up as bits whose values change. We protect against these errors by using a software algorithm by researchers at the University of Surrey. Memory is protected in blocks of 252 bytes. Any single error can be corrected, some some multiple-bit errors can be corrected. Most multiple-bit errors, if they can't be correct, are at least detected. To avoid accumulating too many errors to be corrected, the BBS must read and correct each block on a regular basis, a process called washing. The goal is to read a block often enough to catch the block when it has just one error. Read slower, multiple errors accumulate, read more often, CPU time is wasted.

Before launch, it was estimated that, based on past performance of similar memory in similar orbits, errors would occur at a rate of 1e-7 per bit per day. At this rate, G8NOB determined that a block would need to be washed away only once every 140 days, on average, to ensure against multiple errors. Based on this, file washing was one of the things left out of the first BBS upload, as it was becoming clear that if we waited until everything was perfect we'd never get users on the BBS. We thought we could delay the file wash implementation a month or two before we had a problem. Note also that downloading a file in effect washes it, since any read will correct and re-write the file block. The only files we need worry about are files that sit for a long time without being read.

It now appears that we are getting closer to 1e-6 errors per bit per day in the AO-16 mass memory. One of the purposes of the microsat project is to gather some hard data on the real error rate of these devices, so a different than "expected" rate is not a big surprise. It does mean that we need to be washing files once every 7-14 days instead of once every 140. Now that things have become more stable, I've had a chance to look at things like error rates. Once I saw a higher than predicted base error rate, I looked for occurrences of uncorrectable errors, and indeed, I found some.

GO/K8KA has made implementation of the file wash routine the highest priority, and this feature will probably be uploaded on AO-16 next weekend. In the meantime, these errors may show up as an error message from PHS.EXE, "ERROR — body checksum error". We would be interested in reports from users on such errors. The file should have been completely downloaded, ie be a .DL file, not a .PDL file, and have a body or header checksum error. Please report any such errors to NK6K; include the file number and the day you downloaded the file.

Note that the SEU rate is not an indication of any problem, and does not mean that we expect to have damaged files as a matter of course. The wash rate will be set accordingly, and the problem will go away.

Implementation of the file wash feature is the last missing major piece for round one of the phase implementation of the PACSAT software. We've been adding BBS features since October, the majority of the work being done by GO/K8KA on UO-14, with porting to AO-16 and some minor features by KK6K. The major phases included:

basic file upload, download and simple DIR
More complex DIR
Activity logging
Multple users
Auto file delete
File wash

The Mean Time Between Failure for the AO-16 BBS is heading in the right direction; it has been 17 days since the last crash; we have reloaded twice in that time to fix bugs and add features without losing files.

73s FROM MAURIE VK5EA

ar

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

The second week in January saw the international situation change when all efforts failed to persuade Iraq to voluntarily leave Kuwait. On 17 January, American and other allied air forces commenced bombing military and strategic targets within Kuwait and Iraq. Unfortunately, I was unable to follow events leading up to this point on shortwave, as I was on vacation in Ballarat. But media reports indicated that allied forces had launched electronic counter-measures prior to the outbreak of hostilities, including jamming radar and military communications.

Upon returning to my receiving location, I noticed that some international broadcasters had dumped normal programming to concentrate on news and discussions on what was happening. For example, the BBC World Service in London has hourly news broadcasts up to 15 minutes, and programs such as "The World Today", "24 Hours" and "Newsdesk" being absorbed as continuous Gulf coverage.

The other interesting fact that I quickly noted was the absence of Iraqi external broadcasts. Initially I surmised it was because of allied bombing, but other monitors noted these went silent before the outbreak of hostilities. The only Iraqi outlets I am at present hearing are on 17940, 15600 or 11990, reportedly from Kuwait. The first two have been also reportedly carrying clandestine anti-Iraqi programs, and I have heard both on channel simultaneously, plus Iraqi jamming. Quite a mess! The amount of Iraqi jamming of external Arabic broadcasts has also decreased, whether by design or the result of allied air strikes, I cannot gauge at this juncture.

I have continued to keep an ear on Israel. The English morning news broadcast at 0500 UTC on 11605kHz has been patchy, but a few days after the Iraqi SCUD missiles started to rain down on Tel Aviv and Haifa, a relay of an Israeli network appeared on 15640kHz at 0700 UTC with an unscheduled English newscast followed by Russian programming for the Soviet emigres, who now are daily arriving in Israel. The normal relay of the Israeli commercial programming in Hebrew on 15617 and 21710kHz from 0610 UTC continues at reasonable strength here.

While the world's attention was focused on the Gulf War, tensions also increased within the USSR, following Soviet military intervention in the Baltic republics of Lithuania and Latvia. After the seizure of the radio and TV centre in Vilnius, Moscow suspended the relays of Radio Vilnius on shortwave from senders located elsewhere within the Soviet union. Vilnius reportedly was left with one HF sender plus the domestic AM senders in Kaunas.

Monitors in Scandinavia reported hearing both Baltic republics appeal for help and signal reports of their transmissions. The situation does remain tense as I am writing this. Keep an ear on both the Radio Moscow World Service and those external broadcasts from individual Soviet republics.

My copy of the 1991 World Radio TV Handbook arrived just at the same time that the Gulf War erupted. It has already proved very useful, especially with the alterations to Eastern European broadcasters. There is one puzzling discrepancy, however. Why does the frequency register at the back cut off at 21735kHz? There are broadcasters on allocations above that, including our own Radio Australia. These listings are included within the details of the respective broadcasters, but are excluded on the final register. The World Radio TV Handbook 1991 edition should be in the bookshops shortly, and is highly recommended. **ar**

EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

It is now over a year since examination devolvement became a reality. Perhaps it is time to have a bit of a look at how it is going. Several organisations have run a number of examinations, so by now the worst of the teething troubles should be past.

I have not received a lot of feedback from either candidates or examiners, but from what I do hear it seems that there are still some problems to be overcome by both DoTC and the external examiners. DoTC has made changes to the examination protocols and to the instructions to the examiners rather more frequently than should have been necessary if sufficient forethought had gone into the process. Some examiners are finding that the workload is much higher than was expected, or the returns are smaller, or both.

Before devolvement was proposed, DoTC was confident that its resources could eventually cope with examinations on demand, or at least on a weekly basis at the state offices, and was working towards this ideal. The WIA's early submissions on the devolvement issue also saw this as the ideal, and we planned to enable this to happen. But this was based on the WIA being the only or the major accredited body, and a full-time paid examinations officer to do the organising.

What seems to have happened is that a number of enthusiasts have individually decided for their own reasons to become examiners. In most cases, the main reason has been a genuine desire to help candidates and to encourage new recruits into the hobby. But, with the DoTC 'free for all' policy, there has been no attempt to either limit the numbers of examiners in any areas or to ensure that all areas are served.

The number of candidates is finite, and not significantly larger than under the old system. Preparation and accreditation of a set of examination materials takes the same time however many candidates are to attend. The cost of hiring a venue is not greatly affected by the number of candidates expected. So, if we look at the economics of the system, the ideal is a few big events at a few venues.

But from the point of view of the candidate, the ideal is a small group, close to home, timed for when the individual is ready for it, with the possibility of another attempt shortly thereafter if it is needed.

Unfortunately our present social environment does not provide the number of willing volunteers needed to allow both ideals to work, to provide the quality and frequency of examinations at a minimum cost to both the candidates and the examiners.

It is to be hoped that over the next year, the devolved system will settle down, that communication between examiners and DoTC will clear up most of the current problems, and that we will end up with a system that is fair to all and 'candidate-friendly'. I see the start of 1992 as an appropriate time for the WIA and DoTC to co-operate on a full review of the devolved system.

In the meantime, I am interested in receiving comments, opinions, data and statistics from those who have been associated with devolved examinations on either 'side'. Such items will be of great value when the review is held; but do not wait until then to send them to me. I promise to file them so that I can find them when the time comes.

73, Brenda VK3KT
Federal Education Co-ordinator, WIA
ar

REPEATER LINK

WILL MCGHIE VK6UU
21 WATERLOO CRESCENT LESMURDIE 6076

Audio AGC

Repeater audio quality is one of my pet topics and I have commented on it in a previous article. There is a simple but very effective way of improving your repeater's audio quality, and that is by installing an automatic audio gain control. The most obvious change to a repeater's audio, upon the installation of audio AGC, is the reduction in audio level variations between amateur stations. Instead of audio levels varying from impossible to hear to blowing you out of the car, there will be a middle ground where audio levels are similar. It becomes easy to forget that the audio AGC is working until you compare various audios direct and through the repeater. On some signals marked differences between the direct audio and the repeated audio become obvious. A compromise on just how much compression can be used has to be found. Too much results in an unacceptable level in background noise from mobiles and heavy breathing sounds from stations running correct audio levels. Compression levels somewhere between 6 and 10dB work out best. Six decibels equates to a station running 2kHz peak deviation being increased to 4kHz deviation.

The audio AGC amplifier also enables the repeater's peak deviation to be set. If your repeater runs a clipper in the audio chain then peak deviation would already be set, but the audio AGC amplifier does a better job. Any repeater that is not running some form of deviation limiter can over-deviate, if the incoming audio signal is running excessive deviation. When set up correctly, the audio AGC amplifier results in similar audio levels between amateur stations, better sounding audio with more punch and less distortion due to excessive deviation.

In a future edition of Repeater link, I will include a simple circuit of an audio AGC amplifier. Time has caught up with me.

Sydney-Melbourne

Persistent comment about a Sydney to Melbourne repeater link has been around for over a year and little is known by Repeater Link about who, how, where and when it is all to take place. I have nothing but admiration for those planning such a large linked system. At times even keeping a single repeater on air is difficult enough, let alone several all interdependent. The word is that the system would be based around 70cm input/output to the amateur user, with the linking between the repeaters on 23cm. The use of 70cm to the amateur user is a good one, as it will be a great stimulus to the use of our 70cm band. The project should be supported by amateurs, as it could be the forerunner to other ambitious linking projects. The project may also shake up the linking regulations because, as they stand now, such a proposal does not comply with repeater linking regulations. If you know any more about this project, please let me know because the little I know may be wrong.

Since writing this article, inquiries have

resulted in an address to write. This I have done, and any information about the Sydney to Melbourne link I receive will be passed on in Repeater Link.

Deregulation

Deregulation is a much used word in amateur radio today, and it could well see improvements for the amateur. It may be that amateur radio will move in a direction that will see the Australian amateur leading the world in a few small ways. Always following the leaders will never result in any firsts. Repeater technology in Australia has always followed the leaders. We are even behind New Zealand in repeater linking. In parts of New Zealand, the amateur enjoys a linked repeater system far and above any we in Australia can boast about. Seventy-centimetre repeaters are linked together providing voice and packet operation. While this is in operation and expanding, the Australian repeater system is bogged down in regulations. Yes, we can link repeaters, but not in any innovative ways. The standard commercial method of linking two-way radios is all that the regulations allow. This method (direct linking) offers flexibility, and is the single most important way to link two repeaters together. However, it is expensive, and requires considerable hardware along with the use of extra spectrum space. If deregulation in the repeater field only means changing one regulation for another, then let the regulation change to include off-air linking. DoTC is said not to favour off-air linking, but apart from a couple of rumoured reasons why, it is still to reply to the WIA, which supports off-air linking. In VK6, we look forward to a successful resolution of a situation that has dragged on for over a year. ar

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH CO-ORDINATOR
FREEPOST NO 4 AG LOVEDAY RUBYVALE 4702

Nineteen-ninety saw a consolidation of the new ideas of 1989. These have proved to be worthwhile in assisting DoTC (I hope) to pinpoint the most intrusions into our bands. It also shows DoTC that we are under threat of illegal invasion by irresponsible governments which obviously have no control over their broadcast stations. There is NO valid reason why our Government should not act on our behalf.

A run-down of intrusions follows:

Broadcast mode (A3E, A3J, J3E) 851
RTTY (F1B) 1309
A1A (CW) 1401
Other (F7B, B9W, FSK, P0N, N0N) 507
Total observers in any one month 17

I have not included CB operators. The governments of these intruders are obviously powerless against the numbers, and the ease that sets are modified and/or purchased. Much as we wish otherwise, our Government cannot do any more than state our objections. Let us all be reasonable about it . . . we have NO jurisdiction over these countries . . . a couple of kilowatts might help!

The 10m band needs more use — it is going begging. This large amount of unused air space is just waiting to be used by frequency-hungry nations. All classes of amateurs should rediscover this useful band. Dare I say it? "K" calls should be given more in this area — they could use it for "packet radio communication" which should attract other classes to use it. Use it or face the threat of losing it, now that the purchase of spectrum seems to be just around the corner for VK. It is about time the Government here assisted us and recognised our worth.

UUMS, the Moscow Naval Station in Moscow, transmits for up to 24 hours each day on its various bands — all our bands, I might add. Why are they immune? VRQ, the Vietnam Press, has been observed and reported 446 times for about 24 hours. Again nothing is done to remove them, and they have a lot of "satellites" eg, PKJ, VBX, VPC — the list goes on.

I conclude hoping that 1991 will see some of these observers presently in the Special Survey continuing to some degree in the normal monitoring process.

After March, your skills are sorely needed. My thanks to you for a wonderful effort.

Owing to the weather conditions locally, mail has not been getting to my QTH in time for the summary. Cyclone "Joy" was widespread in effect. Observations received from VKs 4BG, 4AKX, BHJ, BXC, 6HQ, 6RO and 6XW.

The A3E broadcast station which has been consistently observed by VK6RO is no longer with us — what did you use, Graham? We hope this is for "keeps". ar

December 1990 IARUMS Summary

Freq	Date	UTC	Times Logged	EMN	ID	Comments
7002.6	301290	2016	1	P0N		
7053	0612	0948	1		8NT	CQ de 8NT
14023.5	231190	0830+	18	F1B	—	RTTY 250Hz 24 hrs hrd
14048	231190	0850+	19	J3E	—	Rad Phone Indonesia?? 24 hrs
14055	241290	1030+	10	A1A	PKJ	Tfc daily hrd 10 hrs
14058/063	231190	0835+	12	AC3	—	Hellscreiber Ch 24 hrs hrd
14070	121290	1030	8	A1A	VBX	Traffic
14075+	111290	1030	38	A1A	VRQ	Viet Press
14089/91	141290	1254	2	A1A	VPC	Msgs same as VRQ
21023.5	231190	0500+	19	F1B	UMS	ID in CW USR 250Hz RTTY 18 hrs
21283	231190	1015+	29	UUMS	—	ID iN CW USR 250Hz RTTY 18 hrs
21347	231190	0900+	30	F1B	—	250Hz Txt in cypher USR
21405	261190	0400+	12	A3E	—	Com b/caster, no other info
28260	271290	2135	1	A1A	VIP04	VIP04 QSX Ch56 ET16(????)
28478/80	231190	0510+	19	F7B	—	Twinplex
28650/980/	141290	0951+		A3E	—	Com b/cast most music ch

DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

Annual General Meeting

The AGM will be held on Saturday afternoon 4 May 1991 at Amateur Radio House. The closing date for agenda items and council nominations will be 2pm on Wednesday 20 March 1991, at the registered office, 109 Wigram Street, Parramatta. The annual report and meeting notice will be included as an insert to the April issue of *AR*. The report will also include the new membership card, a survey form and details about a lucky draw for a 2m handheld rig. Council nomination forms are available from the Parramatta office.

Gladesville/AUSSAT ATV Test

This had to be deferred from the end of January, when part of the link from the studio to the earth station was taken out of service for a system reconfiguration. This second test is expected to be conducted late February or early March. Details will be on various divisional broadcasts.

80th Anniversary Dinner

It is just about the end of the 80th year since the Institute was founded in Sydney in 1910. It is planned to hold a dinner in late autumn. Please contact the Parramatta office to register your interest during this month.

Storm Damage

A severe storm to parts of Sydney on the

afternoon of 21 January passed VK2WI with minor damage to the beacon antennas. The 6, 2 and 70cm arrays got to know each other better, and these systems were out of service for a few weeks, while alternative verticals were installed pending the repair of the originals. The Dural VK2RSY beacons operate on five bands from 10m to 23cm. Recently the callsign identification has had the Maidenhead locator details added.

Happenings

The March Trash and Treasure is a week earlier due to Easter, now on the 24th at Parramatta on Sunday afternoon. No details to hand when these notes were written, but watch for the annual Urunga Convention on the north coast over Easter. Stocks of the current Australian Callbook now exhausted at the Divisional Bookshop. Many books are available; send a stamped 9 x 4 addressed envelope for a list. An ATV forum at Parramatta mid-march; details on the broadcast. Any groups with an interest in establishing a 6m repeater should apply to the office for the required paperwork. Many groups have already applied. All repeater/beacon co-ordination is carried out through the Divisional office.

New Members

A warm welcome is extended to the following who joined the VK2 Division during January:

K H	Ahamer	VK2GKA	Moss Vale
R H	Ballard	VK2NWT	Bargo
P D	Cooper	Assoc	Tumbi Umbi
R	Davies	Assoc	Marayong
D R	Diss	VK2TDD	Tamworth
F	Fanti	Assoc	Croydon
G	Hinchcliff	VK2GIX	Glebe
H W	Lunney	Assoc	Epping
P	Maloney	Assoc	Junee
G G	Milton	Assoc	Kingsgrove
E	Poole	VK2JBP	Carlingford
J W	Porter	VK2NVX	Summer Hill
P J	Richens	VK2FSD	Lismore Heights
P	Rysdk	VK2MJK	Gosford East

VK3 NOTES

BARRY WILTON VK3XV

Council Nominations

Nominations for the 1991/92 WIA Victorian Division Council will close with the Secretary at 3pm on Thursday 28 March 1991, and must be in writing on a form available from the Secretary.

Nominees need also to complete the form "Consent to Act as a Director" as required by the Australian Securities Commission prior to acceptance.

New Home for Victorian Division

The dramatic decline in property value in Victoria during the past year, together with a decrease in interest earnings on our capital investments, has necessitated a reappraisal of the Division's financial position.

A number of factors, including the cost of rental premises, the desirability of proving long-term investment stability for the future, and the availability of suitable premises at a relatively low cost, have all influenced a Council decision to purchase another property.

The Divisional council has negotiated the purchase of a property similar to the one we are currently renting in Taylor Street, Ashburton.

The new premises, located in Victory Boulevard, Ashburton, are close to public transport — the railway station is about 100m away — have been purchased at a cost of $135,000, and further improvements will be undertaken at a cost of about $40,000.

We are to take possession in July and, following the expiry of our current lease in Taylor Street, will be open for business at the new premises in January 1992.

The Council is confident this investment will serve to consolidate our already sound financial position, and in the long term provide a greater degree of security for the Division. In the short term it will facilitate further expansion of membership services.

Further information will be made available at the Annual General Meeting in May this year.

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

It was with deep regret that we received the sad news of Ann McCurdy's death. I am sure that Council, and indeed anyone who had had dealings with Ann through Federal Office, would wish me to express our sincere sympathies to her family, friends and colleagues in the office. Ann was always friendly and helpful and it was always a pleasure to contact her. It certainly won't be easy to find a replacement for her.

Broadcast Officer

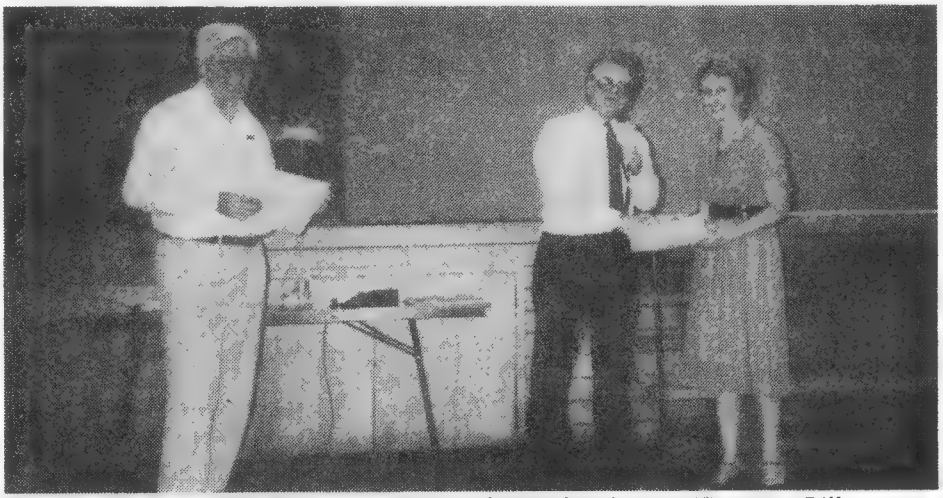
At the time of writing we STILL do not have a Broadcast Officer. Members of Council are taking it in turns at present to do the broadcast, but this is not a very satisfactory arrangement, particularly when you realise that most of them are already doing two or more jobs! (not to mention earning a living in their spare time!). Surely there is someone out there with a couple of hours a week to spare. Don't worry that you might not be technically competent or have the right equipment, advice and the equipment will both be supplied. Perhaps your YL has a pleasant speaking voice and you could work the control. Bevin VK5TV and Barbara Boden worked as a team for years and, as far as I know, Bonnie and Bud Pounsett are still doing the VK4 broadcast this way. Please give it some serious thought.

Council Nominations

By now you will have received forms for Council nominations please give this some serious thought also. Council could use some 'new blood' and, again, the more people they get, the less everyone has to do. If the nomination date has passed, or you've thrown the form away, let a member of Council know if you have had second thoughts, I know they'll squeeze you in somehow!

Diary Dates

Sun 24 March	Barossa Picnic (open to all) Mt Pleasant Oval
Tue 26 March	WIA General Meeting 7.45pm.



President Rowland VK5OU presents Hon Life Membership certificates to Bill VK5AWM and Jenny VK5ANW

VK6 NOTES

JOHN HOWLETT VK6ATA

Notice of AGM

It is hereby notified that the Annual General Meeting of the Western Australian Division of the Wireless Institute of Australia will be held on 17 April 1991 following the General Meeting which commences at 8pm. The meeting will be held at the Westrail Centre, East Perth.

Agenda

1. Consideration of the Council's Annual Report.
2. Consideration of the Financial Report
3. Consideration of other Reports
4. Election of Office Bearers, viz President and Vice-President of the Division and seven other Councillors
5. Election of two Auditors
6. Appointment of a Patron
7. General Business which has been duly notified.

Notice of motion for the AGM must be received by the Secretary not less than 42 days prior to the meeting and must be signed by at least three members.

Nomination of a candidate for election to Council must be received by the Secretary in writing not less than 42 days prior to the meeting, with an intimation that such candidates are willing to act. A candidate may submit statement not exceeding 200 words outlining his or her case for election, and experience. Each nomination shall be signed by two members proposing the candidate. Candidates must possess a current amateur licence.

Proxies

Any financial member entitled to vote may appoint a proxy, who must also be a financial member entitled to vote, to speak and vote on his/her behalf. Each such proxy must be in the hands of the Secretary prior to the meeting and be in the following form:

I..... a member of the Institute, hereby appoint..... also a member of the Institute, to act for me as my proxy and in my name to do all things which I myself being present could do at the meeting of the Institute held on

Signed .....

Witness .....

Date ..... **ar**

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr Cec Crowe	VK2CEC
Mr A J van der Kolk	VK2KKD
Joe Baker	VK2BJX

Joe Baker VK2BJX

Joe died on 24/12/90 in the Alfred Hospital, Melbourne, aged 73. He had not been ill very long, having broken a leg in an accident, but complications were found which necessitated his transfer to Melbourne from Mildura.

Joe was well known to all Sunraysia amateurs and, indeed, to many others, especially those who frequented 80m in the late evenings. Joe was fist licensed in 1978 as VK2NIM, gaining his full call VK2BJX in 1980. Many readers of *AR* will remember his column "Listening Around" which appeared for several years.

His first radio experience came when he joined the Army Signals in 1939, subsequently also serving as a war correspondent. After moving from Sydney to Mildura in the 1950s, Joe became a radio apprentice with a local firm, later branching out on his own as a radio/TV repairman.

Joe was a quiet, unassuming gentleman who will be missed by all those who knew him, both on the amateur bands, and also on the 3UZ talk-back program in Melbourne, where he was a regular caller. Vale Joe.

MARILYN SYME VK3DMS

Cec Crowe VK2CEC

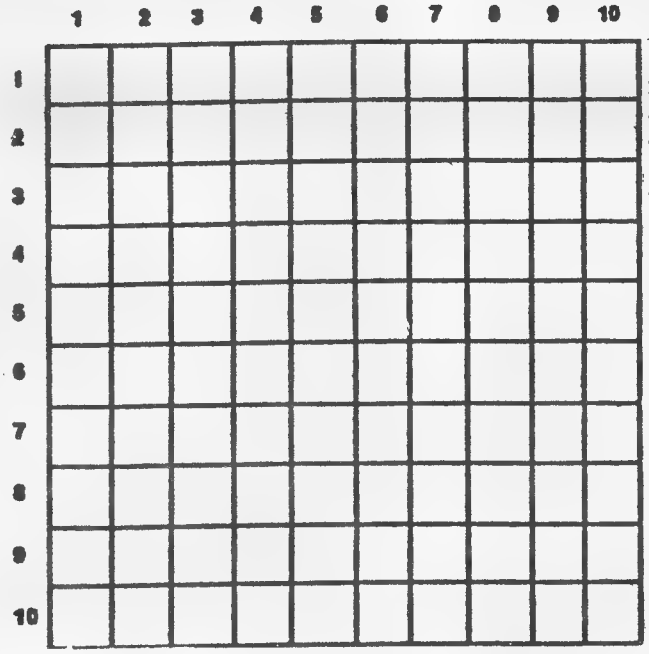
I sadly report that Cecil passed away on 15 November 1990. His untimely death at age 56 was as a consequence of a cerebral haemorrhage. He was an active amateur, operating on HF and VHF from his home in Grafton where he lived all his life.

Cec qualified for his first callsign, VK2BEC/T, in 1966.

After completing school he gained his apprenticeship in radio servicing. Later he worked repairing washing machines and refrigeration equipment. With the advent of television he worked solely on TV, broadcast and two-way radio repairs. He operated his own TV and communication sales and repair business from 1968 to 1980.

In 1956 he joined the State Emergency Services, resigning in 1983 as controller — Grafton.

Morseword No 48



Across

1 Scram
2 Mud
3 Careless
4 Trough
5 Russian city
6 Whole
7 Pond
8 At rest
9 Record
10 Measurements (abbr)

Down

1 Icy rain
2 False
3 Holy man
4 Dirt
5 Noah's son
6 Twelve months
7 Dog
8 Pelt
9 Bicycle
10 Sounds

Audrey Ryan © 1990

Solution Page 56

He volunteered for JOTA exercises as well as other community services activities.

Cec was a keen and skilled technician who constructed many homebrew projects. In 1971 he was proud to have won the VK2 section "A" of the RD contest.

Prior to his death he was active on a nightly HF net in which a number of mainly NSW amateurs participated.

I know that his hobby of amateur radio brought him a great deal of pleasure and was the source of many friendships.

Cec will be sadly missed by his daughter, Debbie, and sons, Brad, Scott and Thomas, together with all who knew him.

Ron W Higginbotham VK3RN

Amateurs will be sad to know of the passing of Ron Higginbotham VK3RN to the ranks of 'silent keys' on 7 January 1991, after a minor operation followed by infection and, finally, a heart failure.

Ron was born in Burnley, Victoria, and on starting work, was apprenticed to the *Richmond Chronicle* where he spent all his working life, finishing in charge of the whole works. The only time spent away from the smell of printer's ink was in 1941 when he joined the Army as a wireless mechanic, working on heavy radio gear.

Ron passed his radio exam on 15/6/38, but, for some reason, didn't take out his licence until 14/1/39.

He was a tireless worker for the WIA, and spent many hours as the editor of *AR* over a period of 10 years. Then, as the printer, he spent many more hours at the *Richmond chronicle,* producing *AR* magazine, until he retired from the editorship in 1964. But this did not end his work for the WIA.

Ron spent many hours in service to WIA, and in recognition of his continued efforts he received life membership, and the "Higginbotham Award" was established in his name. But this was not enough; he still undertook to check all additions and alterations to the callbook, after such a long period as editor of *AR,* as another way of helping the WIA.

He was also a member of the Moorabbin and District Radio Club. Again, due to his continued work, he was made a life member of that club and made a point of attending as often as possible. While being a "stirrer from way back", Ron was justly proud of receiving the "large stirrer's spoon" at the Tuesday morning group meeting at the M&DR Club.

Life had become a bit difficult, healthwise, for Ron over the past few years, being troubled with a number of illnesses which often put him into hospital. But always Ron came up smiling, with a laugh at his disabilities, also with a classic remark of his, "When you have to go, you have to go!" Well, there it is, and we have all lost a good friend with his passing.

To his XYL Helen, his daughter Joy, his son Brian, and their families and grand-families, we tender our deepest sympathy at Ron's passing.

Vale VK3RN Ron Higginbotham.

KEN PINCOTT VK3AFJ
& ED MANIFOLD VK3EM

R A C (Bob) Anderson VK3WY

Mr R A C (Bob) Anderson VK3WY died in Box Hill Hospital on 26/11/90, aged 82.

Bob's introduction to amateur radio came when he and the late Bob Cunningham, who was also a chemist, worked together at Mt Lyell Laboratory. When this was taken over by ICI, Bob continued working there, holding a responsible position in the explosives section during the war years and, subsequently, in administration, until retiring in 1970.

Although active on most amateur bands, he is best remembered for his service to amateur radio as secretary of the Victorian division for 17 years from the early 1930s to the late 1940s, having obtained his full licence callsign in 1930. On retirement as secretary he was granted Life Membership, but continued with the Amateur Advisory Committee for some years. He was also a member of RSGB and RAOTC, and was a member of the post-war Disposals Committee.

In latter years, he was active on 160m with the coffee-break net, his last QSO being just two weeks before he died. His friendliness and many talents will be long remembered by all who knew him.

Our condolences go to his son, daughter and her family.

HERB STEVENS VK3JO

Ian Morris VK3ELS

It is with deep regret that I advise passing of Ian on 15/1/91. Ian was a keen amateur, working his way up from limited (VK3TAD) to combined (VK3KAT) and then finally won the battle with CW and obtained his full call. His main interests lay in both 6m and 70cm and Ian was a member of both the WIA and the EMDRC.

To all those who knew Ian, he will be sadly missed.

DAVE NEVILLE VK3JEM

ar

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS

Evolution of Amateur Radio

The idea of the improvement of international communications by wireless as a hobby seems now to have been largely lost. In 1934, as an English schoolboy, I made my first shortwave wireless set out of scraps, bits and pieces, and became a shortwave listener to international hams and broadcast stations. The noise of kookaburras from Radio Australia annoyed my family as the station closed down for the night.

Morse was used on the American railroads with Professor Morse's many differences from Continental CW which was used by the one-third of the world using the Roman alphabet. In those AM days, CW ham radio was used on the same frequency if things went bad on voice. Of course, everything was home-brew, and in those days the present ham radio examination was good and correct.

Semaphore and CW are still interesting communication hobbies but have nothing to do with real ham radio. Now we have SSB voice coming from black boxes, but the exams are almost unchanged.

Membership has not increased as it should have, and in my family, although I have taught them all to be enthusiastic sailors, none will have a bar of ham radio. The question is — do we need a re-think on ham radio generally?

"GEOFF" WALLACE VK4VLI
8 ORANA STREET
VICTORIA POINT 4165

Technical Content of AR

It seems there has been a change of mind at executive level. I hope you mean — *"We could use more technical articles. We tend to have more than enough general interest material"* (Jan editorial).

Also I hope the corporate managers mean the part of the often-repeated Mission Statement which reads — *"Encourages the maintenance of standards . . ."*

Which standards? Past? Present? Future?

The standard of *AR* technical content is lower than formerly; this in spite of an increase in technical literacy. If we must have technical literature standards — set a lower limit appropriate for the current technical literacy level and leave the upper level open.

Amateur organisations are vacating their traditional place among the leaders of technological development. That appears to be a response to trends engineered by vested interests to create "operator oriented" markets. Today's serious amateurs are more technically informed, and better equipped to search for new knowledge, than ever before. An organisation or publication which can't adjust to meet the new challenges and tries "market manipulation" to match its own mediocrity will fail; some have; and a good riddance.

More and better technical articles please.

Don't let self-training and technical investigation join CW on a "hit list".

LINDSAY LAWLESS VK3ANJ
BOX 112
LAKES ENTRANCE 3909

(I stand my by my January comments, Lindsay. The statement re standards is perhaps a little ambiguous but is intended to mean remaining abreast of current standards and maturing with them. Even if we had a "hit list" CW would not be on it! Ed)

Technical Content

I agree entirely with Drew Diamond, a magazine for radio amateurs has no point if it does not have a solid technical section. Advertising may pay for magazine productions, but it is subscribers that are necessary to convince people it is worthwhile putting their ads in!

Home-made equipment is not in competition with commercial gear, rather it points the way to new products and markets. Outboard additions can enhance the existing performance, especially where, by patient personal adjustment, various stages can be optimised, a 'blueprinted' set of internals!

Many test points are provided in production transceivers for test and alignment. Some of these could be panel, back or front accessible, and preferably buffered. This would make fault diagnosis easier and permit 'in case' final testing. There would then be opportunities for experimental gear to be directly compared, eg testing a new front end or aerial and front end by direction into the receiver IF channel. Access to the receiver input would permit a different aerial to be tested during reception, ie alternative polarisation, active antenna or a loop to null out a strong signal.

I was pleased to see that Drew won the Technical Award, I find his attitude to design and the resulting solutions stimulating. Pressure of work has prevented me constructing any of them but I AM MAKING 'PROGRESS' IN ABANDONING MY CURRENT FIELD OF ENDEAVOUR. I contribute a few comments of a technical nature when possible.

ROBERT R MCGREGOR VK3XZ
2 WILTSHIRE DR
SOMERVILLE 3912

Sending QSL cards

I see from the VK3 notes in January *AR* that there have been complaints from overseas re VK operators not sending QSL cards, and I wonder if my recent experience has been repeated elsewhere.

In the period 18 July to 25 September 1990 I posted 213 QSL cards to the VK2 Bureau in four packages containing, 30, 36, 75 and 82 cards respectively.

On 8 November 1990, the local postmaster returned to me seven loose cards which I had posted on 25 September. These had been found undamaged in a mailbag, six weeks after posting!

On 9 and 10 January 1991, three loose QSLs were returned from a batch posted on 28 June 1990 and 3 August 1990, and, on 11 January 1991, a further card from a batch posted on 18 July 1990.

These packets were securely sealed, but something drastic occurred to each of them in transit by Australia Post, and it has been an expensive exercise in futility. Since I have received only one batch of inward QSLs from the bureau in 1990, I do wonder if it is worth the effort to QSL at all, particularly when cards send direct to DX stations often go astray in the mail too!

DON SHAW VK2BDS/VK3PV
48 THIRTEENTH ST
WARRAGAMBA 2752

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AT YOUR NEWSAGENT EVERY MONTH.

HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

March Charts

For ease of use and to accommodate space restrictions in the magazine, I have provided predictions applicable for three major regions of Australia:

VK EAST Covers the major part of NSW and Queensland.

VK SOUTH Covers southern-NSW, VK3, VK5 and VK7.

VK WEST Covers the south-west of West Australia.

For each of these regions I have selected six "terminals" to major continental regions of the world. To Europe, long path predictions are given in lieu of the short path, as the former is open at more reasonable hours.

The charts explained

These charts are different to those you see published elsewhere, and arguably more useful to the amateur fraternity as they give, effectively, the predicted signal/noise ratio for each hour and for selected bands.

The charts are organised in 24 rows, one for each hour UTC (first column on the left). Don't forget to add the appropriate number of hours for your time zone, including daylight saving where it applies. The next column gives the MUF (maximum usable frequency) for each hour, followed by the field strength at the MUF, in decibels referred to 1 uV/metre (dBU). The column marked FOT gives the "optimum" frequency - the most reliable frequency for the path.

Then come five columns, one for each of five selected HF bands. The numbers in the column represent predicted field strength at each hour in decibels referred to 1 uV/metre. Here it represents "raw" signal to noise ratio as urban noise levels are typically 1-2 uV/metre, but does not take into account the advantage offered by particular transmission modes. The results are based on a transmitter power of 100 W output (except where noted later), the use of modest 3-element beams or similar, and for "median" conditions. Where the results fall below -40 dB, no output is printed.

Enhanced conditions may improve S/N ratios by 9-15 dB. The use of CW or digital transmission modes show better results than SSB. If you've got 400 W output, you get a 6 dB improvement. Where conditions warrant it, I sometimes include predictions for the bands below 14 MHz, deleting the upper bands.

Ten Metres

March being an equinoctial month, the predictions for ten metres show a slight improvement. It only takes a slight "lift" in conditions to dramatically improve conditions on this band during the March-April season, particularly on paths crossing the equator (transequatorial paths). Keep a watch on the short-term geomagnetic and propagation forecasts, which are broadcast by WWV and Radio Australia, or obtainable from the IPS recorded message service on (02) 414-8330.

Broadcasts

The VK2WI and VK3WI Sunday broadcasts carry propagation predictions; for the bands 14 MHz and above listen on the last Sunday of the month for the month ahead, and for the bands 1.8 to 10 MHz, listen on the first Sunday of the month for that month. Often, special predictions covering current or upcoming DXpeditions will be included, so keep a listen out.

VK EAST - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.7	-9	13.7	-18	-8	-7	-11	-17
2	15.4	-20	11.7	-25	-14	-13	-16	-23
3	14.9	-27	11.3	-31	-17	-14	-17	-23
4	18.4	-20	13.8	...	-21	-14	-13	-16
5	25.0	-10	19.1	...	-26	-16	-10	-9
6	31.4	-4	24.5	...	-30	-17	-9	-5
7	32.6	-3	26.4	...	-30	-17	-8	-4
8	31.2	-3	25.1	...	-27	-14	-7	-3
9	29.5	-3	23.4	...	-21	-10	-4	-3
10	27.6	-1	22.0	-34	-13	-5	-2	-2
11	25.6	0	20.3	-22	-6	-1	0	-2
12	23.7	2	18.8	-9	1	3	1	-2
13	22.7	5	17.9	1	6	6	3	-3
14	21.8	9	17.2	11	12	9	4	-4
15	20.7	12	16.4	19	15	11	3	-6
16	19.5	13	15.3	21	16	10	1	-10
17	18.5	14	14.4	21	15	8	-2	-14
18	17.3	15	13.4	21	13	5	-7	-20
19	15.9	15	12.2	19	9	0	-13	-29
20	16.2	15	12.4	19	10	1	-12	-26
21	19.0	13	14.4	21	15	9	-1	-12
22	19.5	10	15.1	13	12	8	0	-9
23	17.9	4	13.8	3	4	1	-6	-15
24	20.0	0	15.5	-8	-1	-1	-4	-11

VK STH - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.8	-3	14.5	-10	-3	-3	-8	-15
2	16.0	-14	12.3	-20	-11	-11	-15	-23
3	15.2	-22	11.6	-26	-15	-14	-17	-24
4	18.9	-17	14.2	-38	-19	-13	-12	-15
5	25.9	-8	19.9	...	-25	-15	-9	-8
6	30.2	-5	25.0	...	-29	-17	-9	-6
7	30.1	-6	24.6	...	-30	-17	-9	-6
8	29.6	-6	23.9	...	-28	-16	-9	-6
9	28.4	-5	22.7	...	-24	-13	-7	-5
10	26.5	-5	20.9	...	-18	-9	-5	-5
11	24.3	-5	19.2	-30	-12	-6	-5	-6
12	21.8	-3	17.2	-17	-5	-3	-5	-9
13	19.4	-1	15.3	-6	-1	-2	-7	-15
14	17.8	3	14.0	4	3	-2	-10	-21
15	16.5	9	13.1	12	6	-2	-14	-29
16	15.5	11	12.2	13	4	-6	-20	-36
17	14.9	12	11.7	14	3	-8	-24	...
18	14.2	13	11.0	13	1	-12	-29	...
19	13.5	14	10.4	12	-2	-15	-34	...
20	12.9	14	9.8	10	-5	-19	-40	...
21	13.9	13	10.5	13	0	-13	-31	...
22	16.4	10	12.3	13	6	-2	-15	-30
23	20.9	7	16.0	11	10	7	0	-9
24	20.0	5	15.4	1	5	4	-1	-8

VK WEST - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.4	▮	14.9	3	5	1	-5	-14
2	16.4	-6	12.6	-10	-6	-8	-15	-25
3	15.5	-15	11.8	-19	-12	-13	-18	-28
4	19.3	-12	14.6	-29	-14	-11	-12	-16
5	26.5	-6	20.4	...	-19	-10	-6	-6
6	33.1	-2	26.2	...	-23	-12	-5	-2
7	32.9	-3	25.8	...	-25	-13	-6	-3
8	32.7	-3	26.8	...	-25	-13	-6	-3
9	32.1	-3	26.0	...	-23	-12	-5	-3
10	30.7	-3	24.6	...	-19	-9	-4	-2
11	28.8	-2	24.3	-33	-12	-5	-1	-1
12	26.8	0	21.3	-19	-4	0	1	-1
13	24.7	2	19.6	-6	3	4	2	-2
14	22.6	5	17.9	7	9	7	2	-5
15	21.4	9	16.9	17	14	10	2	-7
16	20.5	11	16.2	20	15	9	1	-9
17	19.5	12	15.5	21	15	8	-2	-14
18	18.5	12	14.5	21	13	6	-5	-18
19	17.6	13	13.7	20	12	3	-9	-22
20	16.5	13	12.8	18	9	-1	-14	-29
21	15.3	13	11.8	16	5	-5	-21	-38
22	15.9	13	12.2	17	7	-3	-17	-33
23	18.8	12	14.8	20	13	6	-5	-17
24	19.3	10	14.9	14	11	6	-2	-11

VK EAST - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.1	-14	10.2	-17	-10	-11	-16	-25
2	14.7	-12	10.1	-13	-9	-11	-18	-27
3	14.6	-8	10.1	-9	-7	-10	-18	-29
4	13.7	-6	9.6	-5	-7	-12	-22	-35
5	12.8	-2	9.1	-2	-7	-15	-28	...
6	13.4	5	9.7	4	-3	-12	-26	...
7	15.7	8	11.5	10	4	-3	-15	-28
8	20.0	8	14.7	13	11	6	-1	-10
9	20.2	6	15.5	3	6	5	0	-6
10	18.9	-2	14.5	-10	-3	-3	-6	-12
11	18.0	-10	14.2	-20	-10	-8	-11	-17
12	16.8	-18	13.2	-29	-15	-12	-14	-19
13	15.7	-26	12.4	-34	-18	-15	-15	-20
14	15.0	-32	11.7	-37	-20	-16	-16	-20
15	14.3	-37	11.1	-37	-20	-16	-16	-20
16	13.6	...	10.4	-40	-23	-18	-19	-23
17	12.9	...	9.8	...	-29	-24	-25	-31
18	13.9	-40	10.5	-38	-21	-17	-17	-21
19	16.4	-29	12.9	...	-23	-17	-15	-18
20	21.1	-17	16.1	...	-25	-16	-13	-13
21	21.9	-13	15.0	...	-22	-14	-11	-11
22	19.0	-16	12.9	-35	-18	-12	-12	-15
23	17.1	-17	11.6	-28	-15	-12	-13	-18
24	15.8	-16	10.7	-22	-12	-11	-15	-22

VK STH - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.3	-19	9.9	-19	-12	-14	-20	-29
2	14.0	-15	9.7	-14	-11	-14	-22	-33
3	13.8	-11	9.7	-10	-9	-14	-24	-36
4	13.0	-8	9.3	-6	-9	-17	-29	...
5	12.2	-4	8.8	-4	-11	-20	-36	...
6	12.7	3	9.3	1	-8	-19	-35	...
7	14.7	7	10.9	7	0	-9	-23	-38
8	18.3	7	13.6	11	7	2	-7	-18
9	20.8	5	14.4	8	8	5	-1	-9
10	18.5	0	12.8	-1	1	-2	-9	-17
11	16.8	-7	11.5	-11	-6	-8	-14	-23
12	15.4	-15	10.5	-19	-12	-12	-18	-26
13	14.3	-25	10.0	-25	-15	-15	-19	-26
14	13.7	-31	9.4	-28	-17	-15	-19	-25
15	12.8	...	9.0	-35	-22	-20	-24	-31
16	12.3	...	8.7	...	-32	-30	-33	...
17	11.8	...	8.5	...	...	-38	...	...
18	12.7	...	9.3	...	-34	-31	-33	-40
19	14.9	-36	10.1	...	-23	-17	-17	-21
20	18.6	-23	13.8	...	-25	-17	-14	-16
21	20.6	-18	14.4	...	-25	-17	-13	-14
22	17.9	-21	12.5	-40	-21	-15	-14	-17
23	16.2	-22	11.2	-31	-17	-14	-15	-20
24	14.9	-22	10.3	-25	-15	-14	-18	-25

VK WEST - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.0	-29	9.7	-28	-18	-17	-21	-28
2	13.6	-27	9.6	-24	-17	-17	-23	-31
3	13.4	-23	9.5	-21	-15	-17	-24	-34
4	12.6	-21	9.1	-17	-15	-19	-28	-40
5	11.9	-20	8.7	-14	-15	-22	-33	...
6	12.4	-13	9.1	-10	-13	-20	-33	...
7	14.2	-6	10.6	-6	-8	-14	-25	-38
8	17.5	-1	13.1	-1	-1	-5	-13	-23
9	21.1	1	15.8	2	3	1	-4	-11
10	23.1	1	18.2	0	4	3	-1	-7
11	18.9	-3	14.6	-9	-3	-4	-8	-14
12	17.3	-11	13.4	-19	-10	-10	-13	-19
13	16.7	-18	13.2	-27	-16	-14	-17	-23
14	15.4	-27	12.1	-32	-19	-17	-19	-24
15	14.3	-34	11.3	-35	-21	-18	-19	-25
16	13.7	...	10.7	-40	-24	-21	-22	-27
17	12.9	...	10.0	...	-33	-29	-31	-37
18	12.4	...	9.5	...	-38	-34	-37	...
19	11.8	...	9.0	...	...	-40	...	...
20	12.8	...	9.6	...	-36	-32	-33	-40
21	14.9	-37	11.8	...	-24	-19	-18	-22
22	17.4	-28	12.3	...	-26	-19	-17	-19
23	15.7	-31	11.0	-40	-23	-18	-18	-22
24	14.5	-32	10.1	-33	-20	-17	-19	-25

APOGEE ARTS

VK EAST - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.2	-9	11.1	-10	-8	-12	-20	-32
2	17.9	-7	13.8	-16	-7	-7	-11	-17
3	17.5	-11	13.4	-22	-10	-9	-11	-17
4	20.3	-10	15.4	-30	-13	-9	-8	-11
5	26.3	-6	19.8	-38	-17	-9	-6	-6
6	28.0	-6	20.6	...	-18	-10	-6	-6
7	28.3	-5	20.8	...	-18	-10	-6	-5
8	28.3	-5	20.7	-38	-16	-8	-5	-5
9	26.4	-4	20.5	-31	-12	-6	-4	-5
10	24.3	-4	19.2	-23	-8	-4	-4	-7
11	21.9	-3	17.3	-16	-5	-3	-5	-10
12	19.5	-2	15.3	-9	-2	-3	-8	-15
13	17.8	0	14.1	-2	0	-3	-10	-20
14	16.6	4	13.1	5	3	-3	-13	-25
15	15.5	10	12.3	11	4	-4	-17	-32
16	14.9	12	11.7	13	4	-6	-20	-37
17	14.2	13	11.0	13	2	-9	-25	...
18	13.5	14	10.4	13	0	-12	-29	...
19	12.8	15	9.8	11	-2	-15	-34	...
20	13.8	14	9.5	13	1	-11	-28	...
21	13.0	12	9.0	9	-3	-16	-34	...
22	12.5	4	8.8	2	-7	-19	-36	...
23	12.0	-3	8.5	-3	-11	-22	-38	...
24	13.0	-9	9.3	-7	-10	-17	-30	...

VK STH - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.3	-5	9.8	-6	-8	-15	-27	...
2	17.3	-5	13.2	-8	-5	-7	-14	-23
3	16.9	-8	12.9	-14	-7	-8	-13	-21
4	19.6	-7	14.9	-21	-9	-7	-9	-14
5	25.3	-5	18.8	-29	-12	-7	-5	-7
6	26.2	-6	19.0	-33	-14	-8	-5	-7
7	26.2	-6	18.6	-33	-14	-8	-6	-7
8	25.5	-6	18.0	-32	-14	-8	-6	-8
9	24.0	-6	17.8	-26	-11	-7	-6	-9
10	22.1	-6	15.4	-21	-9	-6	-7	-12
11	19.9	-6	13.8	-15	-7	-6	-10	-17
12	17.7	-6	12.2	-10	-6	-8	-15	-24
13	16.0	-4	11.0	-4	-5	-10	-20	-33
14	14.5	0	9.9	0	-5	-14	-27	...
15	13.5	6	9.4	5	-6	-18	-35	...
16	12.9	9	8.9	6	-7	-21	...	...
17	12.0	11	8.4	4	-12	-27	...	...
18	11.6	12	8.2	4	-13	-30	...	...
19	11.2	13	8.0	2	-16	-35	...	...
20	12.1	13	8.8	6	-10	-27	...	...
21	12.3	13	8.6	7	-9	-25	...	...
22	11.9	9	8.4	3	-12	-27	...	...
23	11.4	2	8.2	-3	-15	-30	...	...
24	12.3	-4	9.0	-4	-12	-23	-40	...

VK WEST - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.1	4	11.4	5	0	-7	-20	-34
2	17.9	1	13.5	0	1	-2	-10	-20
3	20.7	1	16.4	-6	1	1	-3	-9
4	26.8	2	20.7	-15	-2	2	3	0
5	30.6	-1	22.9	-24	-7	-1	1	1
6	30.6	-2	25.6	-29	-10	-3	0	0
7	30.5	-2	25.2	-31	-11	-4	-1	-1
8	30.3	-2	24.8	-31	-11	-4	-1	-1
9	29.7	-2	24.0	-29	-10	-3	-1	-1
10	28.5	-2	22.8	-24	-7	-2	0	-2
11	26.6	-1	22.6	-16	-3	1	1	-2
12	24.4	1	19.3	-7	2	3	0	-4
13	22.0	3	17.3	1	5	3	-1	-9
14	19.5	6	15.4	9	8	3	-5	-15
15	17.9	10	14.1	16	10	2	-9	-21
16	16.7	12	13.2	17	9	0	-13	-28
17	15.6	13	12.4	16	6	-4	-18	-35
18	15.1	14	11.8	16	5	-6	-21	-39
19	14.3	15	11.1	15	3	-9	-26	...
20	13.7	15	10.5	14	1	-12	-30	...
21	13.0	15	9.9	12	-2	-16	-35	...
22	14.1	15	10.6	14	2	-10	-28	...
23	14.9	14	11.5	16	5	-5	-20	-37
24	14.1	10	10.8	9	0	-10	-25	...

VK EAST - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.6	2	24.5	-18	-2	3	5	3
2	30.1	2	23.0	-20	-3	2	4	3
3	30.6	2	25.0	-21	-3	2	5	4
4	30.6	3	25.3	-19	-3	3	5	4
5	30.3	3	24.8	-16	-1	4	6	4
6	29.8	4	24.2	-12	2	6	7	5
7	28.5	4	23.0	-4	6	8	8	4
8	27.1	6	22.9	7	12	12	9	4
9	25.8	11	20.6	27	23	19	13	5
10	24.3	11	19.3	27	23	17	10	1
11	22.9	11	18.2	27	21	15	7	-3
12	22.2	12	17.6	27	21	14	5	-6
13	21.5	12	17.1	27	20	13	3	-9
14	20.5	12	16.4	25	18	10	-1	-13
15	19.1	12	15.0	23	14	6	-7	-21
16	18.0	12	14.1	21	11	1	-13	-28
17	16.6	12	12.9	19	7	-5	-21	-39
18	15.0	12	11.6	14	0	-14	-33	...
19	14.9	12	11.5	14	0	-14	-34	...
20	15.6	12	12.0	16	3	-10	-28	...
21	18.6	7	14.7	13	8	1	-11	-24
22	25.9	4	20.1	2	8	9	6	1
23	28.3	4	22.7	-7	4	7	6	3
24	28.8	3	23.5	-13	0	4	5	3

VK STH - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.8	1	24.3	-22	-5	1	3	2
2	30.5	1	25.3	-25	-6	0	3	2
3	30.7	1	25.7	-26	-7	0	3	2
4	30.7	1	25.7	-25	-7	0	3	2
5	30.4	1	25.2	-22	-5	1	3	3
6	30.2	2	24.7	-18	-2	3	5	3
7	29.5	3	23.9	-11	2	6	6	4
8	28.1	4	22.6	0	8	9	8	4
9	26.3	9	20.9	21	20	17	11	4
10	24.3	9	19.2	24	20	15	8	-1
11	22.1	9	17.5	24	18	12	2	-8
12	20.0	10	15.8	22	14	6	-5	-18
13	18.7	10	14.8	21	12	2	-11	-26
14	17.8	10	14.1	20	9	-1	-16	-33
15	16.8	10	13.3	17	6	-6	-22	...
16	16.1	10	12.6	16	3	-10	-28	...
17	15.4	10	12.0	14	0	-14	-33	...
18	14.5	10	11.2	11	-5	-20	...	...
19	13.6	10	10.5	7	-10	-27	...	...
20	14.4	10	11.0	10	-6	-21	...	...
21	17.0	7	12.8	13	4	-6	-21	-38
22	22.0	1	16.9	0	4	2	-3	-11
23	26.4	1	20.7	-9	1	4	3	-1
24	29.0	1	23.1	-17	-2	3	4	2

VK WEST - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.1	2	21.7	-12	0	4	3	0
2	27.7	1	22.5	-16	-2	2	3	1
3	28.3	1	23.5	-19	-3	2	3	1
4	28.6	1	21.8	-20	-4	2	3	1
5	28.9	2	24.2	-19	-3	2	4	2
6	28.8	2	23.8	-16	-1	3	4	2
7	28.6	3	23.4	-12	1	5	5	3
8	28.0	4	22.8	-5	5	8	7	4
9	26.8	6	21.6	5	11	11	8	3
10	25.3	11	21.4	26	23	18	12	4
11	23.8	11	18.9	27	22	16	8	-1
12	22.1	11	17.6	26	20	13	3	-7
13	20.5	11	16.3	25	17	9	-2	-15
14	19.6	11	15.6	24	15	6	-6	-20
15	18.9	11	15.0	22	13	3	-10	-25
16	18.0	10	14.3	21	10	0	-15	-31
17	16.9	10	13.3	18	6	-5	-22	-40
18	16.1	10	12.6	16	3	-10	-28	...
19	15.0	10	11.6	13	-2	-17	-38	...
20	13.8	10	10.6	8	-10	-27	...	...
21	14.0	10	10.8	9	-8	-25	...	...
22	16.4	8	13.0	13	2	-9	-26	...
23	21.1	1	16.3	1	4	1	-5	-14
24	25.1	2	19.8	-6	3	4	2	-3

VK EAST - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.2	-2	24.7	...	-18	-9	-3	-2
2	27.9	-2	22.1	-31	-11	-4	-1	-2
3	25.6	-1	20.3	-19	-5	-1	0	-3
4	23.1	2	18.3	-7	2	2	0	-5
5	21.8	5	17.2	4	7	5	0	-7
6	20.7	8	16.4	13	12	8	0	-9
7	19.7	11	15.6	19	14	8	-1	-12
8	18.6	12	14.6	20	13	6	-4	-16
9	17.8	13	13.9	20	12	4	-7	-20
10	16.2	14	12.6	18	9	0	-14	-29
11	14.5	14	11.2	15	4	-7	-23	...
12	14.6	14	11.1	15	4	-7	-23	...
13	17.7	13	14.0	20	12	4	-8	-21
14	19.6	10	15.4	17	13	7	-1	-11
15	17.6	6	13.6	7	6	1	-7	-17
16	17.1	-2	13.3	-5	-2	-5	-12	-21
17	15.6	-11	12.0	-14	-9	-11	-17	-27
18	15.7	-17	12.0	-23	-13	-13	-17	-25
19	18.3	-16	14.5	-33	-17	-12	-13	-17
20	23.7	-10	18.3	...	-22	-13	-9	-10
21	28.3	-6	22.2	...	-26	-14	-8	-6
22	29.7	-5	22.8	...	-27	-15	-8	-5
23	29.7	-4	24.7	...	-27	-15	-7	-4
24	30.2	-3	25.0	...	-24	-12	-6	-3

VK STH - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.7	-2	23.0	...	-18	-8	-3	-2
2	29.1	0	23.1	-30	-11	-3	0	0
3	27.1	1	21.5	-17	-3	1	2	0
4	25.0	3	19.8	-5	3	5	3	-1
5	23.9	6	18.9	5	9	8	5	-1
6	22.9	9	18.1	14	14	11	5	-2
7	21.8	11	17.3	20	17	12	5	-4
8	20.3	12	15.9	21	16	10	1	-9
9	19.1	13	14.9	21	15	8	-2	-14
10	17.2	14	13.3	20	11	3	-9	-23
11	15.1	14	11.6	16	6	-5	-20	-37
12	14.8	14	11.4	16	5	-6	-22	-39
13	15.8	13	12.4	17	6	-4	-19	-35
14	15.1	8	11.8	9	1	-8	-22	-38
15	14.4	0	11.2	0	-4	-12	-25	-40
16	13.7	-11	10.5	-10	-10	-16	-26	-40
17	13.0	-20	9.9	-17	-14	-18	-27	-40
18	14.0	-24	10.5	-23	-15	-16	-22	-32
19	16.5	-21	13.0	-31	-17	-14	-16	-22
20	21.2	-14	16.2	...	-21	-14	-11	-13
21	25.7	-9	20.0	...	-25	-15	-10	-9
22	28.6	-7	22.7	...	-27	-16	-9	-7
23	29.8	-5	24.2	...	-27	-15	-8	-6
24	30.6	-4	25.4	...	-24	-13	-6	-4

VK WEST - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.4	-3	24.8	...	-26	-14	-6	-3
2	28.0	-3	22.2	...	-20	-10	-4	-3
3	25.5	-3	20.2	-36	-14	-7	-3	-3
4	23.0	-2	18.2	-24	-8	-3	-2	-5
5	21.6	0	17.1	-13	-2	0	-2	-6
6	20.5	3	16.2	-4	3	2	-1	-8
7	19.5	7	15.5	6	7	5	-1	-10
8	18.5	11	14.5	14	11	6	-3	-13
9	17.8	14	13.8	19	13	6	-4	-16
10	16.3	15	12.6	19	11	2	-10	-24
11	14.6	16	11.2	17	7	-4	-18	-35
12	14.7	17	11.2	18	7	-3	-18	-35
13	17.8	16	14.1	23	15	8	-3	-16
14	17.1	12	13.5	16	10	3	-8	-21
15	16.1	6	12.8	7	4	-2	-13	-25
16	15.6	0	12.2	-2	-1	-6	-15	-26
17	15.0	-9	11.6	-11	-7	-9	-16	-27
18	14.2	-18	11.0	-18	-11	-12	-18	-27
19	13.5	-27	10.3	-23	-14	-14	-19	-27
20	14.5	-28	11.0	-29	-16	-13	-16	-22
21	17.2	-22	13.5	-39	-19	-14	-13	-16
22	22.2	-13	17.0	...	-25	-15	-11	-10
23	26.7	-8	20.9	...	-29	-17	-10	-7
24	29.5	-5	23.5	...	-30	-17	-8	-5

VK EAST - USA/CARRIBBEAN

VK STH - USA/CARRIBBEAN

VK WEST - USA/CARRIBBEAN

APOGEE ARTS

HAMADS

TRADE ADS

● AMIDON ferromagnetic cores: for all transmitter and receiver applications. Send DL-size SASE for data/price to: RJ & US Imports, Box 431 Kiama NSW 2533. (No enquiries at office please . . . 14 Boanyo Ave, Kiama). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Electronic Components, ACT; Truscotts Electronics, Melb.

● AMTOR/RTTY/CW/FAX/SSTV software for PCs by G4BMK. AMTOR supports ARQ, FEQ and Listen modes, $75; RTTY 40-110 baud Baudot/ASCII, $50; CW, $50; FAX, $50; SSTV, $40. Full details from Dave Ralph, VK4ASB, 23 Darwin St, Aspley, Qld, 4034. (07) 263 3872 AH.

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high-resolution shortwave weatherfax, Morse & RTTY receiving program. Needs CGA, SSBhf radio and RADFAX decoder. Also RF2HERC, RF2EGA & RF2VGA, same as RADFAX2 but suitable for Hercules, EGA & VGA cards respectively, $35. SATFAX is a NOAA, meteor and GMS weather satellite picture-receiving program. Used EGA or VGA modes. Needs EGA or VGA colour monitor and card, & WEATHER FAX PC card, & 137MHz receiver, $45. All programs are on 5.25" or 3.5" disks (state which) & documentation, add $3 postage. Only from M Delahunty, 42 Villiers St, New Farm, Qld, 4005. Ph (07) 358 2785.

FOR SALE - NSW

● PACKET RADIO: Get started with BEEPAK plus Microbee computer-in-a-book. Computer, monitor, Beepak, printer cable, software for computer and associated programs, Beepak, all with full documentation, $650. Roger Chubb VK2FGE, (067) 72 7840 QTHR.

● EIMAC 2C39A UHF triodes, new in sealed containers, $20 each posted. Goulburn Amateur Radio Society, PO Box 350. (048) 21 5036.

● TEN-TEC transceiver 509-4206 P/S 247 crystal calibrator 206-A CW filter 208 microphone 215-P, $350. Plus freight. Shure microphone 444D, $80 posted. VK2AKE QTHR. (048) 71 2113.

● BWD 539A dual-trace CRO 10MHz B/W C/W two probes, handbook, TV triggering, in original carton, $350 ono. Lloyd VK2ELB. (02) 639 7007 QTHR.

● FT200 transcvr, power supply, instruction book, box spare valves, mic, $300 ono. George VK2YT QTHR (02) 625 2602.

● KENWOOD SM220 station monitor, and BS-8 Pan display adapter. Brand new, has never been connected or turned on, packets still unopened, still boxed, $725 ono. A Walsh VK2TBW. (048) 61 2092.

● GENUINE IBM-XT computer, 20meg hard disk, 360K floppy, mono screen, with lots of software, word processing, spreadsheet, data base etc, $800. Also NEC 3550 Spinwriter, letter-quality printer, $300. All in good working order. Will assist with initial tuition if req. Will consider swap for synthesised HF xcvr. VK2KGG QTHR (02) 958 8703.

FOR SALE - VIC

● KENWOOD TS820S transceiver with VF0820 external VFO and MC50 desk microphone, $725. Mike Trickett VK3ASQ QTHR. BH (052) 78 9766, AH (052) 78 1986.

● YAESU FT-207R h/h with speaker mike mobile p/s wallcharger and soft carry-case handbook, $285 sn J020018. C-64 1541 disk-drive p/l B/W monitor, $300. Compakratt cartridge and RS232 converter for C-64, $70. VK3BIL. (03) 762 2119.

● ONE + 12V DC 5A 4+31V 3A power supply, $120. One 12V 1 amp DC battery eliminator, $15. One 24V 1.3A transformer, $25. One 240V 30rpm single-speed motor, $40. One anti-static mat & wrist straps, $20. 100 lengths aluminium tubing 4m long, 10mm O/DIA 2mm wall thickness, $8 length. Evan VK3EJV, AH (03) 438 2878.

● YAESU FT208, EC, incl batt and mic, $225. Realistic PRO31 hand-held programmable scanner, as new with box and manual, $225. (03) 782 1115. Norm VK3ZEP QTHR.

● 144 MOBILE 10W transceiver 23ch incl old ch41 to 63 incl main repeaters. Works well, w/mobile mount, mic, $70. Variac 2A 0-285V GE pattern, small area overheated, but works well, $30. VK3SZ, QTHR. (03) 560 4305.

● LINEARS Yaesu FL2100B S/No 280400 with manual, $675; Heathkit SB200 with manual, $600; spare valves extra. VK3EQO QTHR (03) 592 6236.

● TRIBAND full-sized beam Telrex (better than TH6DXX) $235. Ted VK3TG. (052) 59 3225.

● SEASIDE QTH 3BR BV home, outside shack, Nally tower, bay view, excellent UHF/VHF. QTH Ted VK3TG. (052) 59 3225.

● KENWOOD TS440S H/F transceiver with manual, $1695. Bert VK3BH. QTHR (03) 857 9438.

FOR SALE QLD

KEYER AEA MM2 2.99wpm Memorys, Trainer and Beacon facilities exc cond. Greg VK4UXX (074) 461 357 QTHR

FOR SALE - SA

● TS520 includes CW filter. FL2100B linear, both EC. Doc (086) 49 1956.

FOR SALE - WA

● OLD BOOKS — Cable and Wireless Comms of World-Brown, 2nd ed, 1930. Feedback, Crowhurst, 2nd ed, 1953. Frequency modulation, Sturley, 1950. Transistor Radio, Circuitry and Servicing, Mullard, 1962. Transistor and Crystal Diodes, Bettridge, 1954. Superhet Receiver, Witts, 1935. Radio Lab Handbook, Scroggie, 2nd ed, no date. Valve Technique, RSGB, 1948. Mullard Valve Regulator (Zenerdiode), 1966. Radio Designer's Handbook, Langford Smith, 1942. Handbook of Wireless Telegraphy, vol 1, 1938. Handbook of Wireless Technology, vol 2, 1938. Electrical and Radio Notes for Wireless Operator, Airmen, 1938. Radiotron Designer's Handbook, Langford Smith, 1944. Jones Radio Handbook, 1937. ARRL Handbook, 1935. II books in good condition and deserving a good home. Cost? Donation to WIA. Neil Penfold VK6NE QTHR (09) 409 9333.

FOR SALE - TAS

● YAESU FV707DM ext VFO, $200; FRB707 relay Box, $30; FT707 svce man, $30; Alinco EMS-1Z spkr mic, suit DJ500T, $40. Above as new. QTHR VK7AN (003) 31 7914.

WANTED- VIC

● SOCKET & DATA for COSSOR 2.5in (6cm) CRT type no 23-D. Power transformers: 240V primary, 100-0-100 up to 250-0-250 sec at 50ma & 2 filament windings of 6.3V at 1amp and 3amp CT. Bruce VK3YBW (03) 527 2661 after 6pm. QTHR.

● YAESU FRG7 com RX, must be in GC, required for the widow of a SK. Bruce Kendall VK3WL. (03) 741 7654 (H), (03) 741 1127 (B).

WANTED - WA

● INTRUDER WATCH OBSERVERS in VK6. Free tape, logs, postage & advice. Please help. Contact Graham VK4RO QTHR (09) 451 3561.

WANTED - QLD

● WANTED BY WWII signaller, books, British Army signals WWII Nalder, History of Radio in South Australia. Ross, Secret Warfare, Lorain, International Radio Tube Encyclopaedia. VK4EF,
● 97 jUBILEE TCE, BARDON, 4065. (07) 366 1803 AH please.

● KEYER AEA MM2 2.99wpm memory, trainer and beacon facilities, EC. Greg VK4UXX (074) 46 1357 QTHR.

WANTED - SA

● 6M CW Transceiver home-brew OK. QRP HF transceiver, Argonaut, Shimizu, Century 21 or similar. Doc (086) 49 1956.

Radio Amateur Helps Save Life

Need help urgently— then break into a net — someone is bound to hear your call.

That is exactly what happened when a missionary lapsed into a coma while in Sierra Leone, West Africa. Neilie Connolly EI6CB of Skibbereen in County Cork came to the rescue after receiving a desperate call for help. His actions over many hours helped save the life of Belinda Landy who had contracted cerebral malaria.

During the drama, Sierra Leone had no external phone links and authorities gave Neilie permission to handle the traffic.

After consulting with doctors on the missionary's deteriorating condition it was decided to air-lift her to the London Hospital for tropical diseases. A medical team from France made a mercy flight in an air ambulance. After reaching London her condition was stabilised within a day and she soon came out of the coma. While in the hospital recovering for a month Belinda Landy was amazed and grateful of the efforts made by Neilie EI6CB.

Sign of the Times

Thefts of cars for their radios and stereo gear in New York has seen motorists eager to advertise the fact their vehicle doesn't have such equipment installed.

Thousands of cars in New York are carrying the sign: "No radio on board". The same theft problem exists in Australia, and perhaps the sign will catch on here?

Amateur Radio Helping our Community

Stolen Equipment

Stolen from VK2TPH on 21 January 1991: One Alinco ALD24T 2m/70cm mobile rig, serial number 10107310. This radio is easily identified by noticing two antenna cables protruding from the rear panel, due to internal diplexer by-pass surgery. Would anyone who is offered this rig please contact Dapto Police on (042) 61 7144.

Stolen from VK2FLM on 23 December 1990: Yaesu transceiver FT102, serial number 3K990835, engraved number B62075. If any information, contact local police.

Prevent Pirates

Make sure you sell your transmitter to a licensed amateur

HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

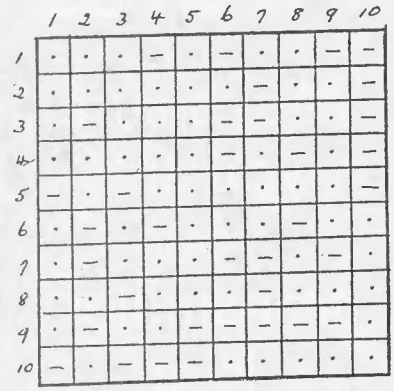
*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

Solution to Morseword No 48



Across: 1. Scat; 2. Silt; 3. lack; 4. sink; 5. Kiev; 6. entire; 7. lake; 8. idle; 9. log; 10. yds.

Down: 1. sleet; 2. fake; 3. saint; 4. dust. 5. Shem; 6. year; 7. pug; 8. skin; 9. bike; 10. tonnes.

TRADE PRACTICES ACT
It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

VICTORIAN CONSUMER AFFAIRS ACT
All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the boxholder or seller of the goods.

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Tel: (03) 500 9464

PRINTING: Industrial Printing
Richmond

MAIL DISTRIBUTION: Polk Mailing Co.
PO Box 140,
Collingwood,
Vic. 3066
Tel:(03) 417 5161

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HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

.....

Call Sign (if applicable): .....

Address: .....

.....

.....

State and Postcode: .....

VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	Inwards – GPO Box 757G Melbourne Vic 3001 Outwards – 38 Taylor St Ashburton Vic 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger St Adelaide SA 5000
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Anderson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Divisions Directory on page 3 for the address of your Division)

	Ref	Price to Members
ANTENNA BOOKS		
Ant. Compendium Vol 2 Software only	BX293	$18.00
Antenna Compendium Vol 1 ARRL	BX163	$19.80
Antenna Compendium Vol 2 & Software ARRL	BX294	$32.40
Antenna Compendium Vol 2 ARRL	BX292	$21.60
Antenna Handbook -Orr	BX217	$15.57
Antenna Impedance Matching - ARRL	BX257	$27.00
Antenna Note Book W1FB - ARRL	BX179	$18.00
Antenna Pattern Worksheets Pkt of 10 - ARRL	BX211	$5.40
Antennas 2nd ed John Kraus	BX259	$93.60
Beam Antenna Handbook - New ED. 1990 Orr	BX215	$17.37
Cubical Quad Antennas - Orr	BX214	$13.05
HF Antennas - Moxon RSGB	BX188	$27.00
Novice Antenna Notebook DeMaw - ARRL	BX162	$14.40
Practical Wire Antennas - RSGB	BX296	$25.20
Reflections - Software 5 in disk	BX358	$18.00
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Smith Chart Expanded Scale PK of 10	BX903	$5.94
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$5.94
The Antenna Handbook - ARRL	BX161	$32.40
The Truth About CB Antennas - Orr	BX219	$15.57
Transmission Line Transformers - ARRL	BX329	$36.00
Vertical Antenna Handbook - Lee	BX284	$16.65
Vertical Antennas - Orr	BX220	$14.27
Yagi Antenna Design - ARRL	BX164	$27.00
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The ATV Compendium - BATC	BX270	$15.75
The Best Of CQ-TV - BATC	BX273	$15.75
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Radio Call Book Supplements 1991 Due June	BX364	$15.75
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Electronics Data Book - ARRL	BX201	$21.60
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Operating Manual - RSGB	BX359	$25.20
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Spark to Space - ARRL 75th Anniversary	BX310	$36.00

	Ref	Price to Members
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Interference Handbook - Nelson	BX181	$16.02
Radio Frequency Interference - ARRL	BX186	$8.55
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Amidon Ferrite Complete Data Book	BX44	$7.65
Design Notebook W1FR - ARRL	BX357	$18.00
DX Power - K5RSG	BX356	$18.00
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Shortwave Receivers Past and Present	BX253	$15.84
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Amateur Radio Awards Book - RSGB	BX297	$27.00
DXCC Companion	BX345	$10.80
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Prefix Map of The World	BX234	$7.20
Radio Amateurs World Map	BX236	$7.20
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Transmitter Hunting - TAB	BX222	$32.31
PACKET RADIO BOOKS		
AX.25 Link Layer Protocol - ARRL	BX178	$14.40
Computer Networking Con (Packet)		
Computer Networking Con (Packet) No 5 1986 - ARRL	BX167	$18.00
Computer Networking Con (Packet) No 6 1987 - ARRL	BX168	$18.00
Computer Networking Con (Packet) No 7 1988 - ARRL	BX184	$22.50
Computer Networking Con (Packet) No 8 1989 - ARRL	BX295	$21.60
Computer Networking Con (Packet) No 9 1990 - ARRL	BX360	$21.60
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Packet Users Notebook - Rogers	BX285	$16.65
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If the item is carried by your Divisional Bookshop, but is not in stock, your order wil be taken and filled as soon as practicable.
All prices are for WIA members only – postage and packing, if applicable, is extra.
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As an Amateur operator, you know what you want in an HF rig. In fact, although Icom are THE professionals when it comes to communications, it is the Amateurs from whom we seek guidance when designing and developing superior equipment. That's why Icom leads the way in Amateur Communications. If space here permitted, we could go into lengthy discourse about Icom's outstanding features and options, but you're probably aware of most of them. Just to prompt your memory, here's a brief summary of our HF Range –

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